SIEMENS

MOBILETT XP

SP

Replacement of Parts

System

Replacement of parts:

Valid for
- MOBILETT XP
- MOBILETT XP Eco
- MOBILETT XP Hybrid
- MOBILETT XP Digital

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Document revision level

The document corresponds to the version/revision level effective at the time of system delivery. Revisions to hardcopy documentation are not automatically distributed.

Please contact your local Siemens office to order current revision levels.

Disclaimer

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Table of Contents 3

1 General information 6

Performing work activities . . . 6
Text labeling . . . 7
Icons . . . 8
Cleaning . . . 9

2 General information on replacing parts 10

Required Documents . . . 10
Required tools, test equipment and aids . . . 11
Principle for the replacement of parts . . . 12
Information regarding product safety and protective measures . . . 13

3 System overview 16

System overview for MOBILETT XP/Eco/Hybrid users . . . 16
System overview for MOBILETT XP Digital users . . . 17
Orientation . . . 18
System overview - MOBILETT XP/Eco/Hybrid modules . . . 19
System overview - MOBILETT XP Digital modules . . . 22
Overview of printed circuit boards . . . 24

4 Replacement of electrical components 26

D916 (CPU) . . . 26
Replacing D916 . . . 26
D916 settings . . . 27
D908 (control panel, XP/ Hybrid/ Eco) . . . 33
D909 (manual control panel, XP Digital) . . . 34
D917 (galvanic separation) . . . 35
Replacing D917 . . . 35
Adjusting D917 . . . 35
D927 (power supply) . . . 36
Removing D927 . . . 36
Adjusting D927 . . . 36
U1/U2 (direct voltage power supply units) . . . 37
Removing U1/U2 . . . 37
Adjusting U1/U2 . . . 37
Capacitor bank (D952/D962/D972/C1-C12) . . . 38
Capacitor bank check . . . 38
Complete removal of the capacitor bank (D952/ D962/ D972/ C1-12) . . . 39
Removing D952 (capacitor charger) . . . 43
Removing D962 (kV inverter) . . . 44
Removing D972 (capacitor board) . . . 45
C1 - C12 (12 x 10mF / capacitor bank) . . . 47
Board battery operation and motor control (Hybrid/Digital) . . . 49

D982 (battery chargers) . . . 49
Battery blocks (BK1/2 & BK3/4) . . . 50
D102 (motor control) . . . 52

5 Replacement of mechanical components 54

Adjusting the articulated arm . . . 54
Parallelism . . . 54
Counterweight . . . 57
Adjustment of the friction linings . . . 58
Movement of the fork . . . 59
Movement of the single tank . . . 59
Replacing the spring unit . . . 60
Replacement of the single tank . . . 63
Replacing the support arm cable harness . . . 66
System brakes . . . 69
Inspection and replacement . . . 69
Brake force adjustment . . . 69
Castors . . . 71
Friction linings . . . 72
Replacing the horizontal friction lining . . . 72
Replacement of the vertical friction linings . . . 72
Power cord or cable winch . . . 75
Transmission belt (Hybrid/Digital) . . . 81
Replacement of the belt . . . 81
Adjusting the belt tension . . . 83
Replacing the motor unit (Hybrid/Digital) . . . 84

6 Calibrating the DAP system (option) 85

Calibrating the DAP system (option) . . . 85
Recalibration procedure . . . 85

7 Multileaf collimator 88

Replacing the collimator lamp . . . 88
Work steps: . . . 88
Replacing the collimator . . . 92
Light field - radiation field . . . 94
Evaluation: light field to radiation field . . . 94

8 Imaging System (XP Digital) 96

Detector . . . 96
Replacing the detector . . . 96
Replacing the detector cable . . . 100
Detector cover panels . . . 102
"Powerbox" and power supply U3/U4 . . . 104
Replacing the "powerbox" . . . 104
Replacing the U3 power supply (DC/DC transformer) . . . 105

Replacing the U4 power supply (DC/AC transformer) 106
CXDI PC 107
Replacement of CXDI PC 107
Replacing the network adapter 108
Touch screen display 114
Mechanical replacement of the touch screen display 114
Perform touch calibration 114
Brightness and contrast settings 115
Final activities 115

9 Changes to Previous Version 116

. 116

Performing work activities

Any technician duly assigned by the local Siemens office is authorized to perform maintenance and service work.

Certain tasks may also be performed by other technical personnel (e.g. the customer's hospital technicians). These tasks are marked by the icon shown here.

In such cases it is absolutely necessary:

- to observe all instructions in the text and graphics;
- to use the specified tools, test equipment and aids.

You can also contact your national Siemens Uptime Service Center for support.

Text labeling

⚠ DANGER	**DANGER indicates an immediate danger that if disregarded will cause death or serious physical injury.**
⚠WARNING	**WARNING indicates a possible danger that if disregarded can cause death or serious physical injury.**
⚠CAUTION	**CAUTION used with the safety alert icon indicates a possible danger that if disregarded will or can lead to minor or moderate physical injury and/or damage to property.**
NOTICE	**NOTICE used without the safety alert icon indicates a possible danger that if disregarded may or will lead to an undesirable result or state other than death, physical injury or property damage.**
NOTE	**NOTE is used to indicate information which explains the proper way to use devices or to carry out a process, i.e. which provides hints and tips.**

Icons

Warning about ionizing radiation or radioactive substances. Tests and adjustments that must be performed with the radiation switched on are indicated by this radiation warning icon.

Dangerous electrical voltage > 25 VAC or > 60 VDC.

Caution! General hazard warning.

ESD: Warning about electrostatically sensitive components.

Report icon. Used to indicate entries in certificates.

Certain tasks can also be performed by other technical personnel (e.g. the customer's hospital technicians).

U
S

Certain sections apply only to the USA. These sections are marked with this icon.

Cleaning

- Always disconnect the MOBILETT from the power supply and switch it off before cleaning or disinfecting it.
- Never use abrasive cleaners or cleaning agents with solvents (e.g. cleaning solutions, alcohol or spot removers), since they may damage housing surfaces.
- Do not spray anything on or into the unit.
- Wipe off the MOBILETT with a cloth moistened in water or a diluted, lukewarm solution of water and dishwashing liquid.

For more information, see the Chapter on "Cleaning and disinfection" in the operating instructions.

Required Documents

• **General safety information**	TD00-000.860.01...
• Start-up Instructions	SPR8-230.814...
• Software Installation (only for MOBILETT XP Digital)	SPR8-230.816.30...
• Quality Assurance (only for MOBILETT XP Digital)	SPR8-230.820.30...
• Troubleshooting Instructions	SPR8-230.840.01...
• Troubleshooting Guide (only for MOBILETT XP Digital)	SPR8-230.840.30...
• Wiring Diagram	SPR8-230.844...
• Operating instructions	SPR8-230.621...

Required tools, test equipment and aids

NOTE

For some activities, it is recommended that a work jacket with long sleeves and insulated gloves be worn.

• Standard service tool kit	
• Leakage current measuring device, e.g.:	51 38 727 Y0766
• Ground wire tester or e.g.:	51 38 727 Y0766
• 2.1 mm precision copper filter (or alternatively, copper filter set 4406 120 RV090) for MOBILETT XP Digital	90 00 598 RV090
• Dose measurement device, e.g. PTW DIADOS	97 17 612 Y0388
• Densitometer, e.g., DensiX-LE 52003	49 51 286 Y0388
• Digital multimeter, e.g.: Fluke 8060 A	97 02 101 Y4290
• Centering cross	96 60 051 RE999
• mAs meter (e.g.: 81 60 400) or 2-channel storage oscilloscope with ± 2.5% accuracy	
• kV meter (works with the filter comparison method) or 2-channel storage oscilloscope with +/- 2.5% accuracy	
• 2-channel storage oscilloscope with 2.5% accuracy, e.g.: Textronics 2232	97 02 239 Y3155
• Spring balance for 350 N	
• Torque wrench for 8-40 Nm, e.g.:	99 00 846 RE999
• Calibration tool for the "DAP measurement system" option	65 84 978
• Adjuster for tensioning the drive belt	65 64 301
• Rope (min. length 4 m; min. tensile strength 1000 N)	
• Loctite 242	
• Viscogen oil	
• 2 pieces of wood, approx. 50 x 75 x 500 mm	

NOTE

A ground measurement must always be performed after work in the interior of the system.

Principle for the replacement of parts

Replacement of electronic parts

Defective FRU ("Field Replaceable Units") are only to be replaced with spare parts listed in the Siemens spare parts catalog for medical equipment.

FRU ("Field Replaceable Units") are not to be repaired.

ESD guidelines must be met for all work.

Functional check and adjustments

After components are replaced or repaired, any necessary adjustments are made without the system covers.

Once proper functioning has been established, the system covers are fitted.

The ground wire measurement and possibly the leakage current measurement must be performed for the completely assembly system after the completion of all work.

A functional test including an exposure must be subsequently performed.

Information regarding product safety and protective measures

⚠ DANGER

While performing maintenance and service work
on the MOBILETT XP digital with the covers removed,
it is possible to come into contact with components under voltage.

Carelessness can result in death or serious bodily injury.

When conducting maintenance and service work, follow:

- **the product-specific safety information contained in the technical documentation,**
- **and the general safety information (TD00-000.860.01...).**

⚠ DANGER

Remove or install components only if:

- **- The system is switched off, and**
- **- The capacitors are discharged, and**
- **- The ESD guidelines are followed, and**
- **- The batteries were disconnected (only Hybrid/Digital).**

⚠ DANGER

Releasing radiation:

- **Checks and settings for which radiation must be released are to be marked with the radiation warning symbol.**
- **Radiation protection measures are to be used.**

⚠ DANGER

To avoid electrical shock from components under voltage, also be aware that:

The capacitors of the capacitor bank can be electrically charged even when the system is switched off and the power cable is disconnected!

In the case of an error, individual capacitors of the capacitor bank can still be electrically charged when disconnected from the charging circuit!

Disconnect the battery blocks in the XP Hybrid/Digital prior to maintenance and service work!

Carelessness can result in death or serious bodily injury.

- ➪ **Make sure that no parts or tools fall into the unit;**
- ➪ **Do not touch potentially dangerous components (Fig. 1 / p. 15)**
- ➪ **If loose parts must be removed from the unit, use only insulated tools;**
- ➪ **Protect the work area so that no other persons are able touch the unit while the covers are open or removed!**

- Switch the unit off before servicing or maintenance. Always disconnect the power plug first.
- Make sure that the main switch is switched off.
- The capacitor bank discharges to < 40 V in approx. 15 minutes.
  - ➪ The safety covers can be removed after this period has elapsed.
- Prior to performing any work, it must be verified that areas with dangerous voltage are voltage-free (Fig. 1 / p. 15).

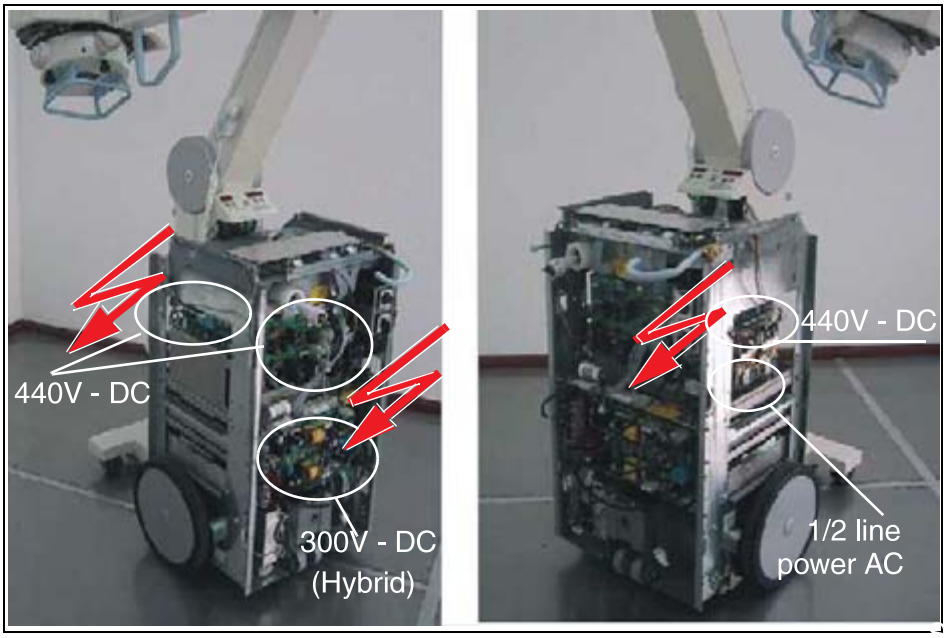

Fig. 1: Locations with dangerous voltage

With the covers open and safety covers removed:

Back:

CAUTION: DC voltage (300 V) from the battery block to PCB D982!

Always disconnect the battery plug from BK1-BK4.

CAUTION: DC voltage (440V) at capacitor bank (D927)

Left side:

CAUTION: DC voltage (440V) directly at the capacitor bank!

Right side:

CAUTION: DC voltage (440V) directly at the capacitor bank!

CAUTION: AC voltage (> 100 V or > 60 V half line voltage) at power supplies U1 and U2 as long as the power cord is connected.

System overview for MOBILETT XP/Eco/Hybrid users

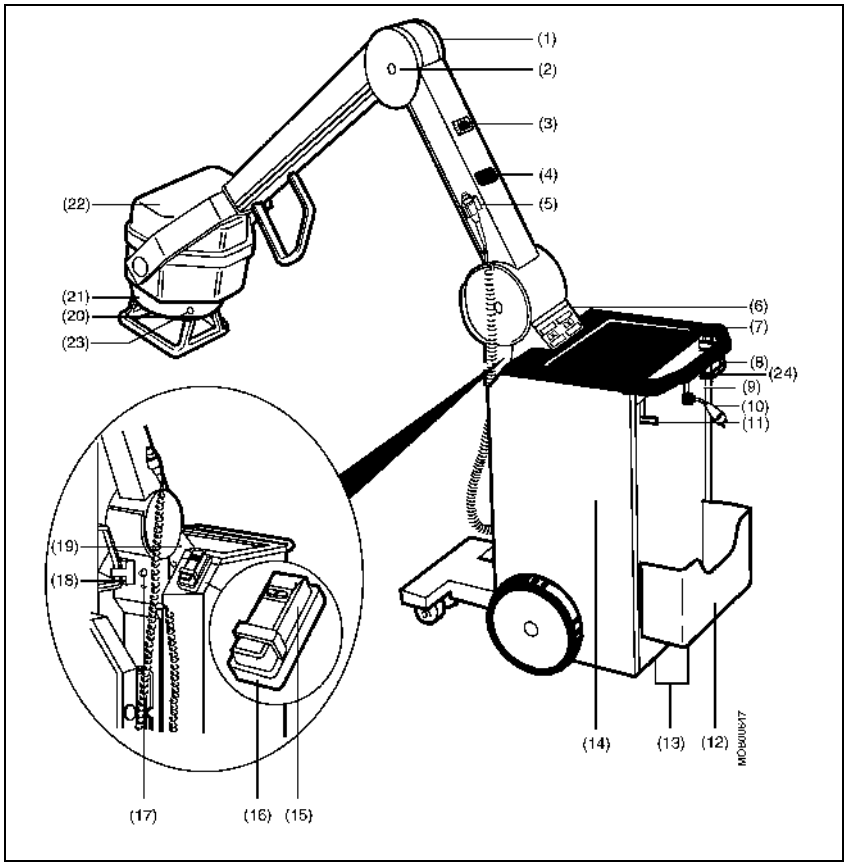

Fig. 2: User overview_01

(1) Hanger for lead apron	(13) Support rollers
(2) Articulated arm	(14) Console with chassis
(3) Sensor for IR remote control (optional)	(15) IR remote control (optional)
(4) DAP display (optional)	(16) Holder for IR remote control (optional)
(5) Exposure switch (S27)	(17) Potential equalization connector
(6) Control panel and display field	(18) Transport safety device
(7) Transport handle	(19) Stand column
(8) Hand/parking brake handle	(20) Collimator
(9) Main switch	(21) DAP ionization chamber (optional)
(10) Power cord	(22) X-ray tube assembly
(11) Brake handle for cable winch	(23) Light localizer buttons (two sides)
(12) Cassette compartment	(24) Motor control (Hybrid)

System overview for MOBILETT XP Digital users

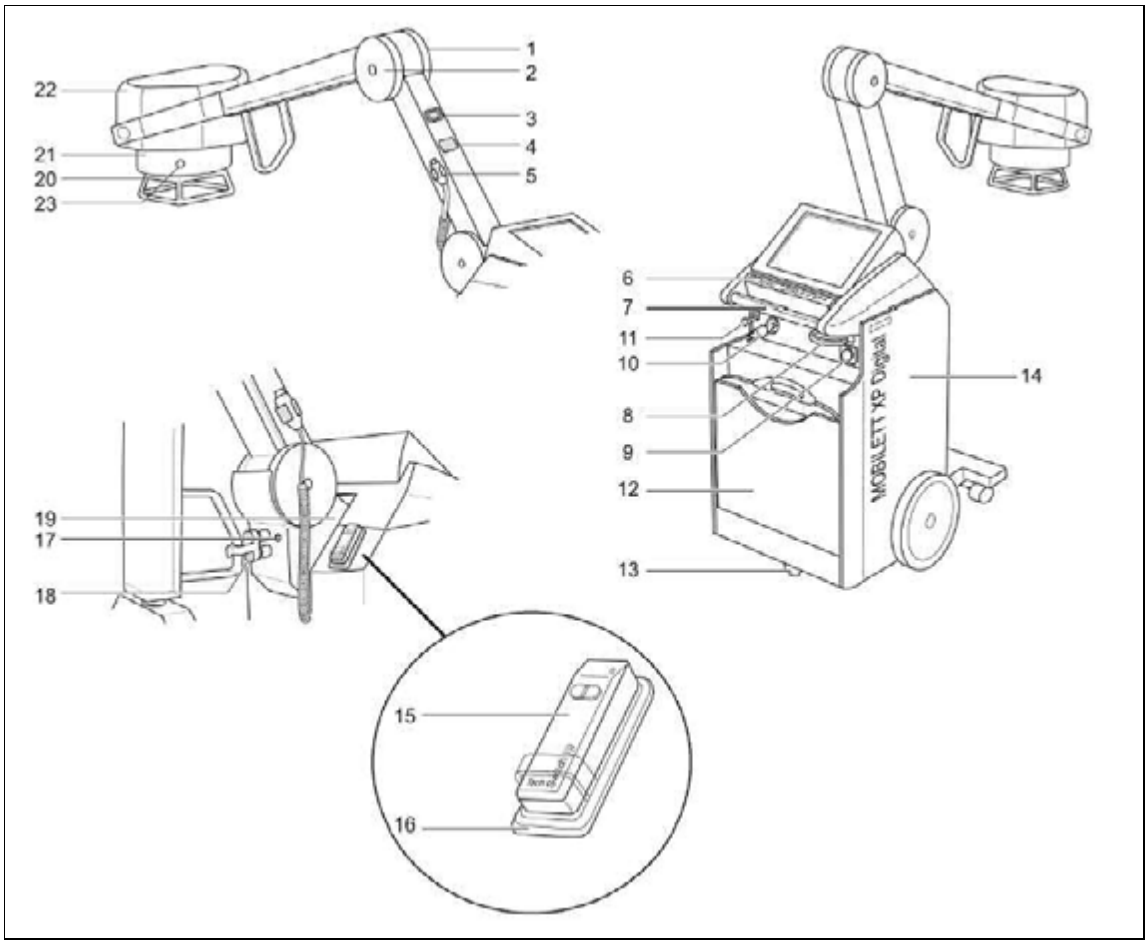

Fig. 3: User overview

(1) Hanger for lead apron	(13) Support rollers
(2) Articulated arm	(14) Console with chassis
(3) Sensor for IR remote control (optional)	(15) IR remote control (optional)
(4) DAP display (optional)	(16) Holder for IR remote control (optional)
(5) Exposure switch (S27)	(17) Potential equalization connector
(6) Control panel and display field	(18) Transport safety device
(7) Transport handle/motor control	(19) Stand column
(8) Hand/parking brake handle	(20) DAP ionization chamber (optional)
(9) Main switch	(21) Collimator
(10) Power cord	(22) X-ray tube assembly
(11) Brake handle for cable winch	(23) Light localizer buttons (two sides)
(12) CXDI-50G detector holder	n.a.

Orientation

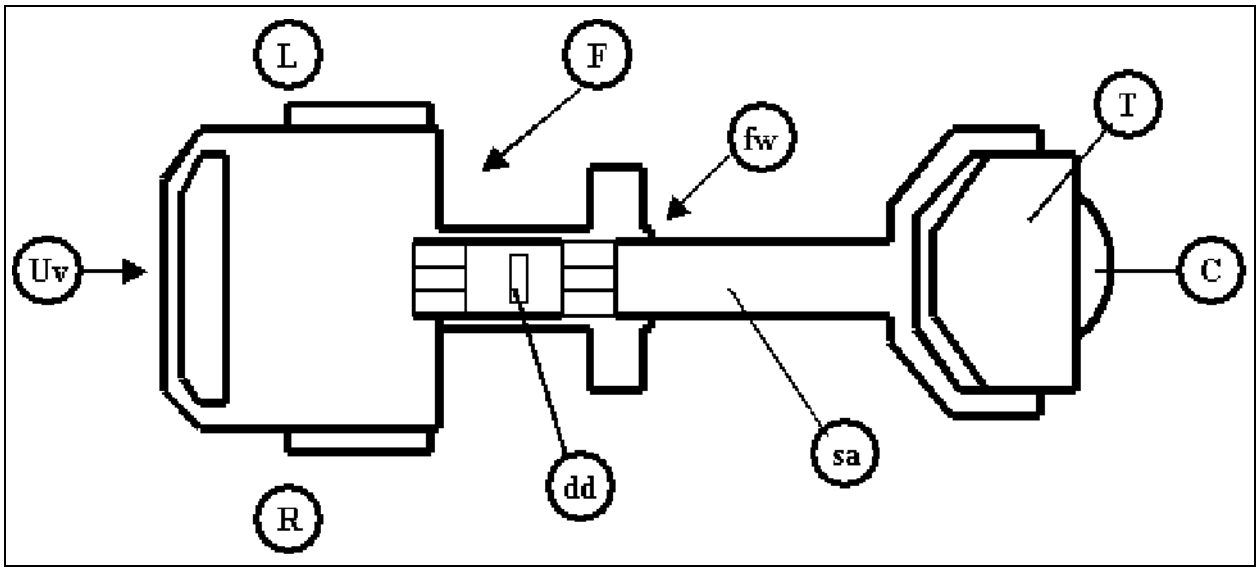

Fig. 4: Top view of system_01

System orientation for a better understanding of the technical description	
Abbreviations	**Explanation**
Uv	User view - back
L	Left side of unit (**l**eft)
R	Right side of unit (**r**ight)
F	Front side (**f**ront)
fw	Front wheels (**f**ront **w**heels)
sa	Support arm (**s**upport **a**rm)
T	Tube (single **t**ank)
C	Multileaf collimator (**c**ollimator)
dd	DAP display (**d**ose **d**isplay)

NOTE

These orientation indicators are used in all technical documents. Descriptions are always from the "forward travel" user view. Use these descriptions when communicating with third parties (e.g., USC/HSC).

System overview - MOBILETT XP/Eco/Hybrid modules

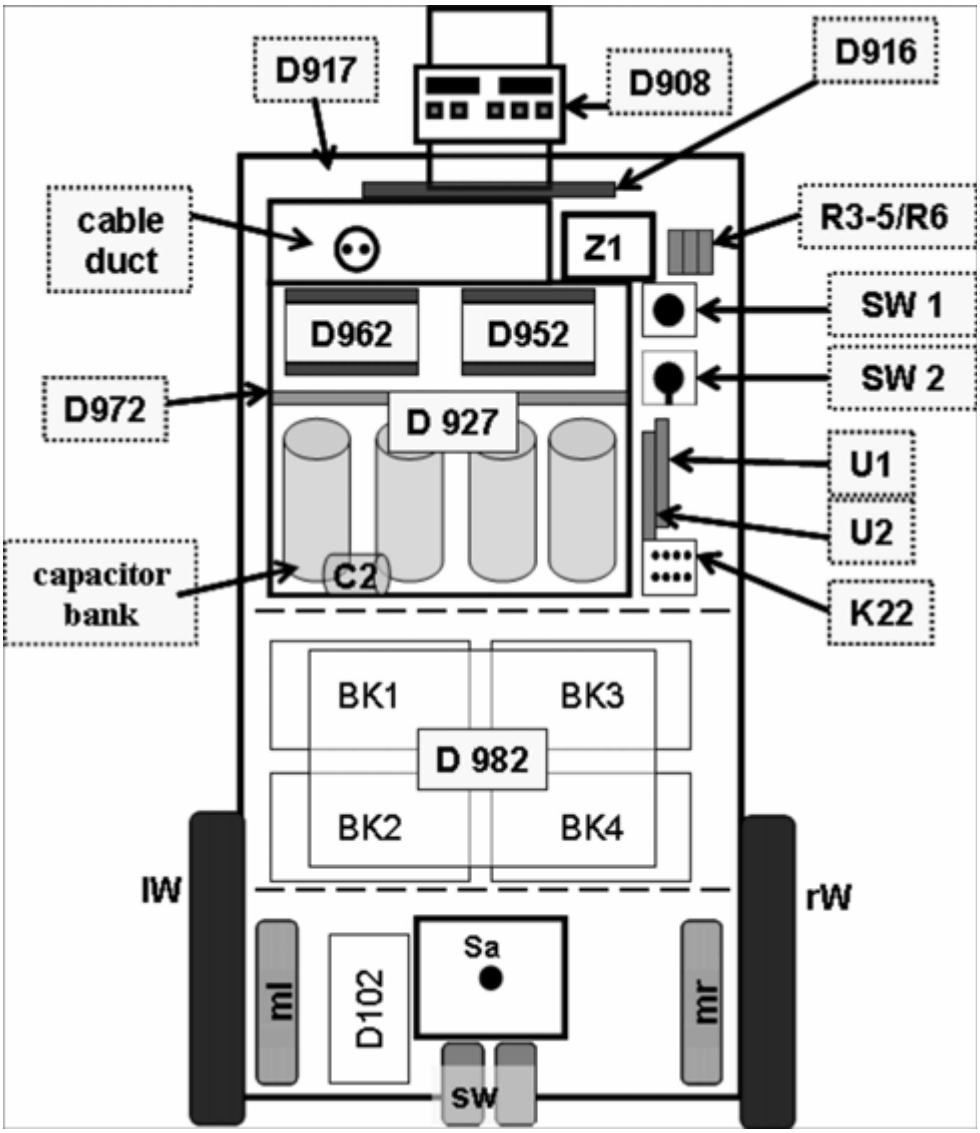

Fig. 5: Schematic overview of XP, Eco, Hybrid

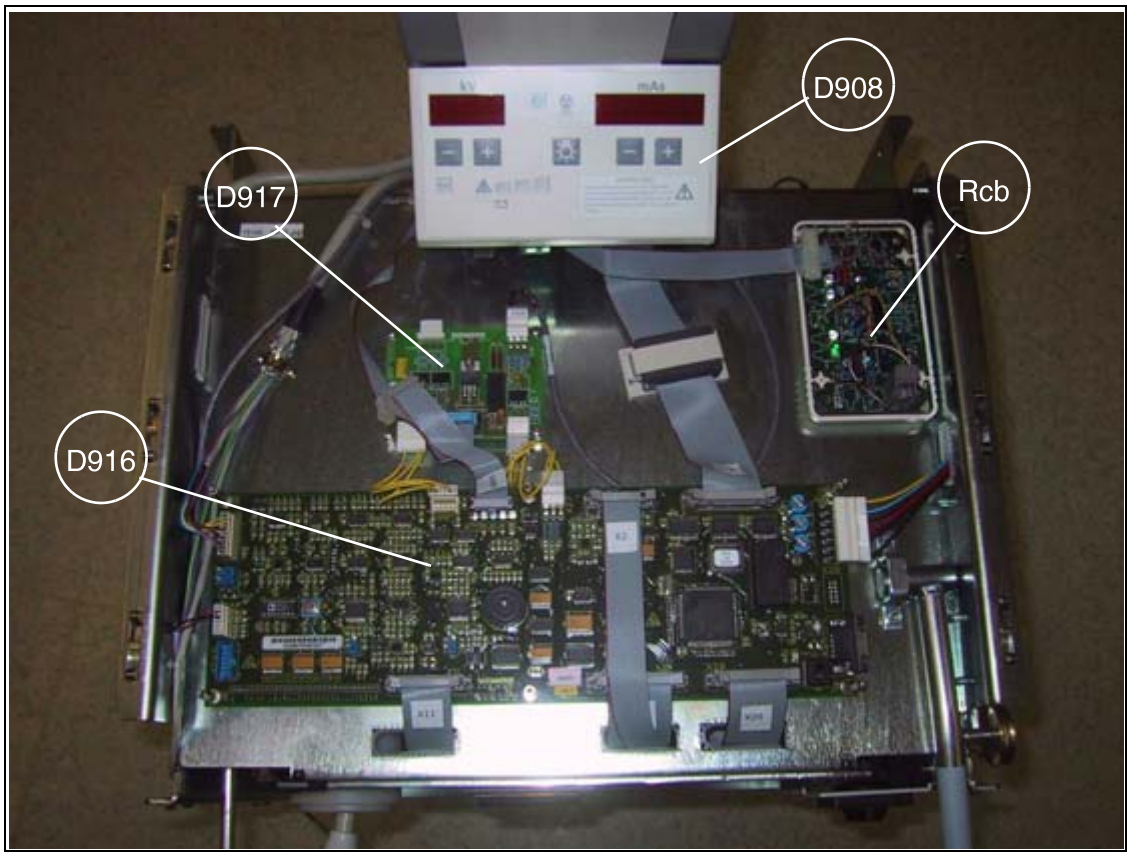

Fig. 6: Top view_01

Common parts of MOBILETT XP, Eco and Hybrid	
Abbreviations	**Explanation**
D916	CPU board
D908	User display and control
D917	Galvanic separation for S27/DAP/remote
Rcb	Remote control board (remote control option)
SW1	Key switch, power ON/OFF
Z1	Line filter
C1 (R1)	Capacitor for inverter with discharge resistor (front left side/not shown here)
C2 (R2)	Starter capacitor with discharge resistor
R3-5/R6	R3-R5 capacitor bank discharge resistors (front right side), R6 discharge resistor for service
Capacitor block	12 x 10 mF capacitors, mounted with D972
K22	Main relay
U1	+5V/± 15V power supply

U2	+24V power supply
D927	Power supply
D952	Capacitor bank charging board (behind D927)
D962	kV inverter (behind D927)
D972	Capacitor bank board (behind D927)
Sa	Support arm adjusting spring
sw/rw/lw	Support rollers and back wheels
Additional components for MOBILETT XP Hybrid only	
SW2	Op. mode selector (battery/off/power)
D982	Battery charger
D102	Motor drive control
BK1/BK2	Battery block, left
BK3/BK4	Battery block, right
mr/ml	Motor right/motor left
Optional parts for MOBILETT XP, Eco and Hybrid (not shown in illustration)	
DAP chamber	Dose area product measuring chamber (mounted on the collimator)
D991	DAP adapter board (mounted in the collimator cover)
DAP display	DAP display board (mounted in the lower arm segment cover)

System overview - MOBILETT XP Digital modules

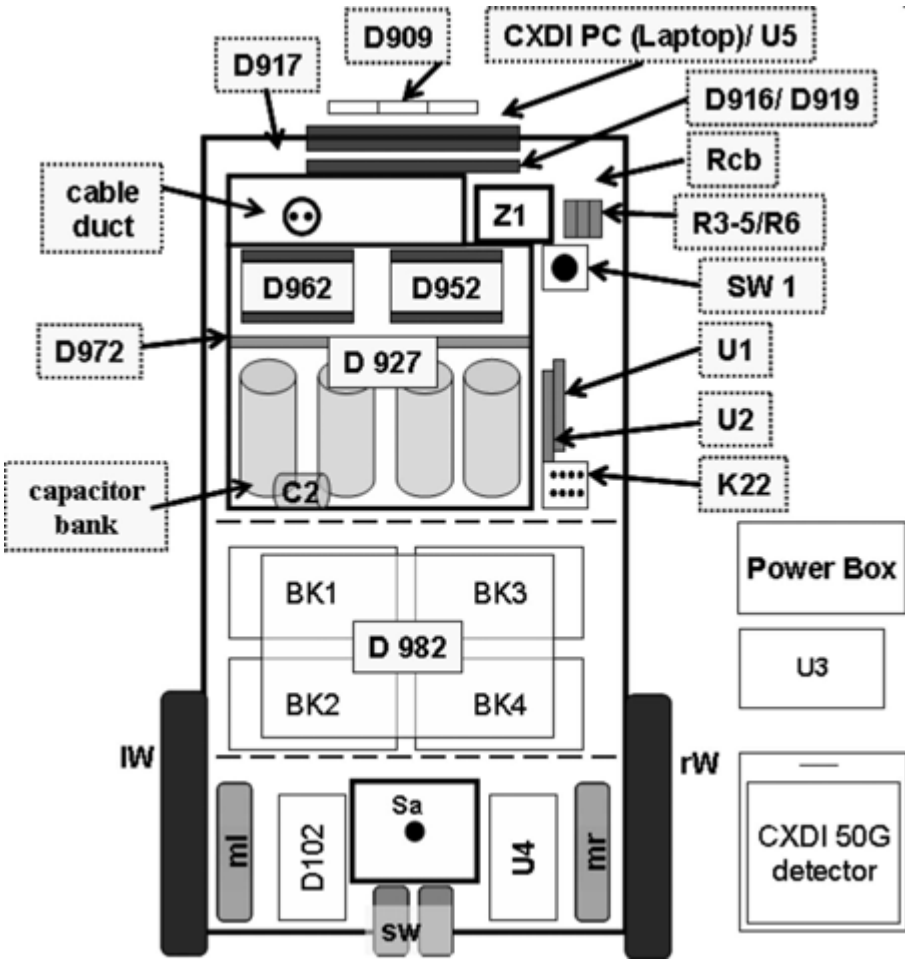

Fig. 7: Schematic overview of XP Digital

MOBILETT XP Digital parts	
Abbreviations	**Explanation**
D916/D919	CPU board/X-ray interface
D917	Galvanic separation for S27/DAP/remote
Rcb	Remote control board (remote control option)
SW1	Key switch, power ON/OFF
Z1	Line filter
C1 (R1)	Capacitor for inverter with discharge resistor (front left side/not shown here)
C2 (R2)	Starter capacitor with discharge resistor
R3-R5, R6	R3-R5 capacitor bank discharge resistors (front right side), R6 discharge resistor for service
Capacitor bank	12 x 10 mF capacitors, mounted on D972

K22	Main relay
D909	X-ray display and keyboard
U1	+5V/± 15V power supply
U2	+24V power supply
D927	Power supply
D952	Capacitor bank charging board (behind D927)
D962	kV inverter (behind D927)
D972	Capacitor bank board (behind D927)
Sa	Support arm adjusting spring
lw/rw/sw	Support rollers and back wheels
D982	Battery charger
D102	Motor drive control
BK1/BK2	Battery block, left
BK3/BK4	Battery block, right
mr/ml	Motor right/motor left
CXDI PC	Laptop for the imaging system
CXDI detector	CXDI flat detector
Power box	Connecting unit between CXDI PC and CXDI detector
U3	DC converter 300 V DC/24 V DC
U4	Inverter 24 V DC/220 V AC
U5	Power supply CXDI PC (laptop)
Optional parts for MOBILETT XP Digital (not shown in illustration)	
DAP chamber	Dose area product measuring chamber
D991	DAP adapter board (mounted in the collimator cover)
DAP display	DAP display board (mounted in the lower arm segment cover)

Overview of printed circuit boards

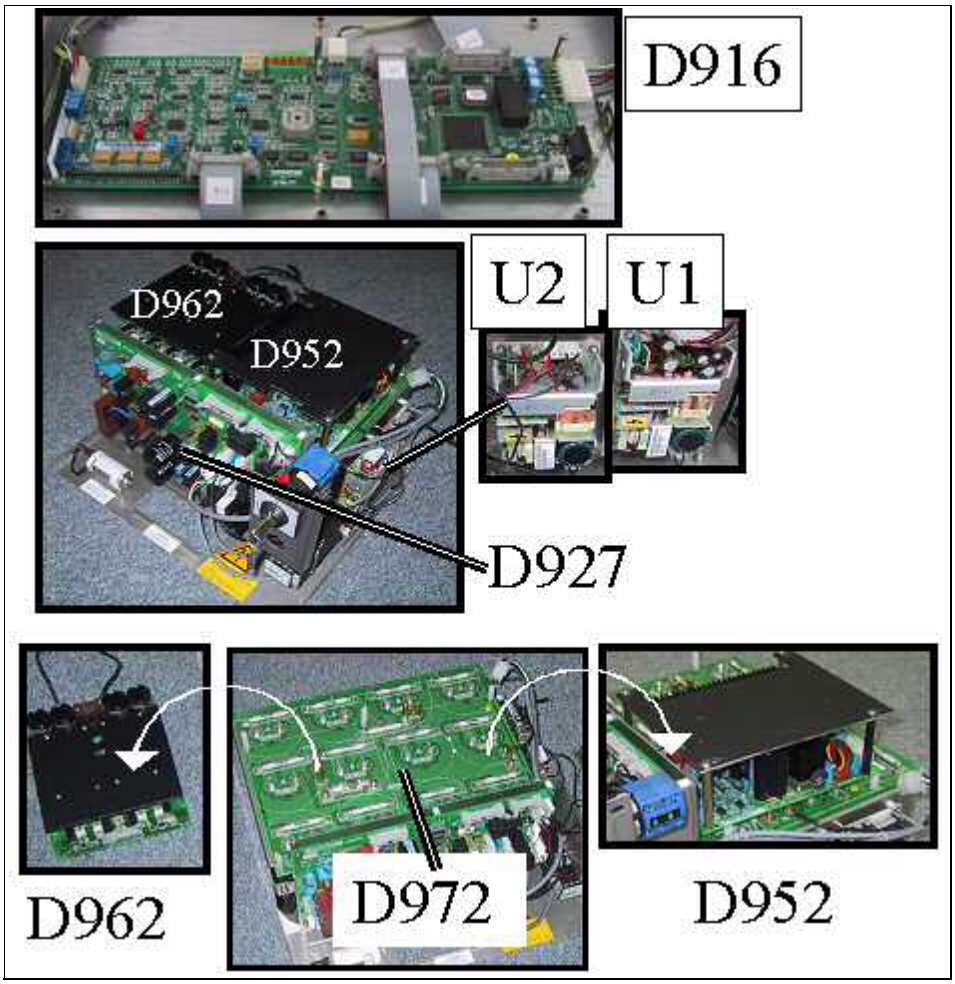

Fig. 8: Overview of printed circuit boards

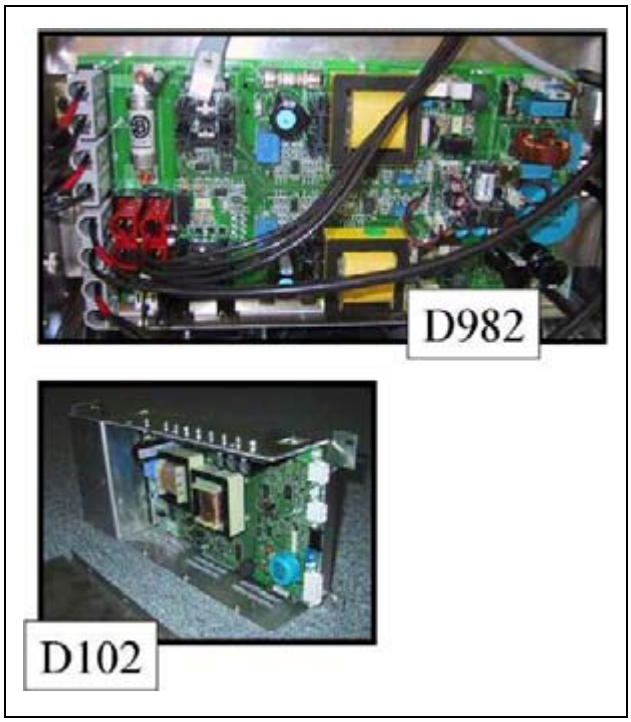

Fig. 9: Hybrid_boards (battery_charger and motor control)

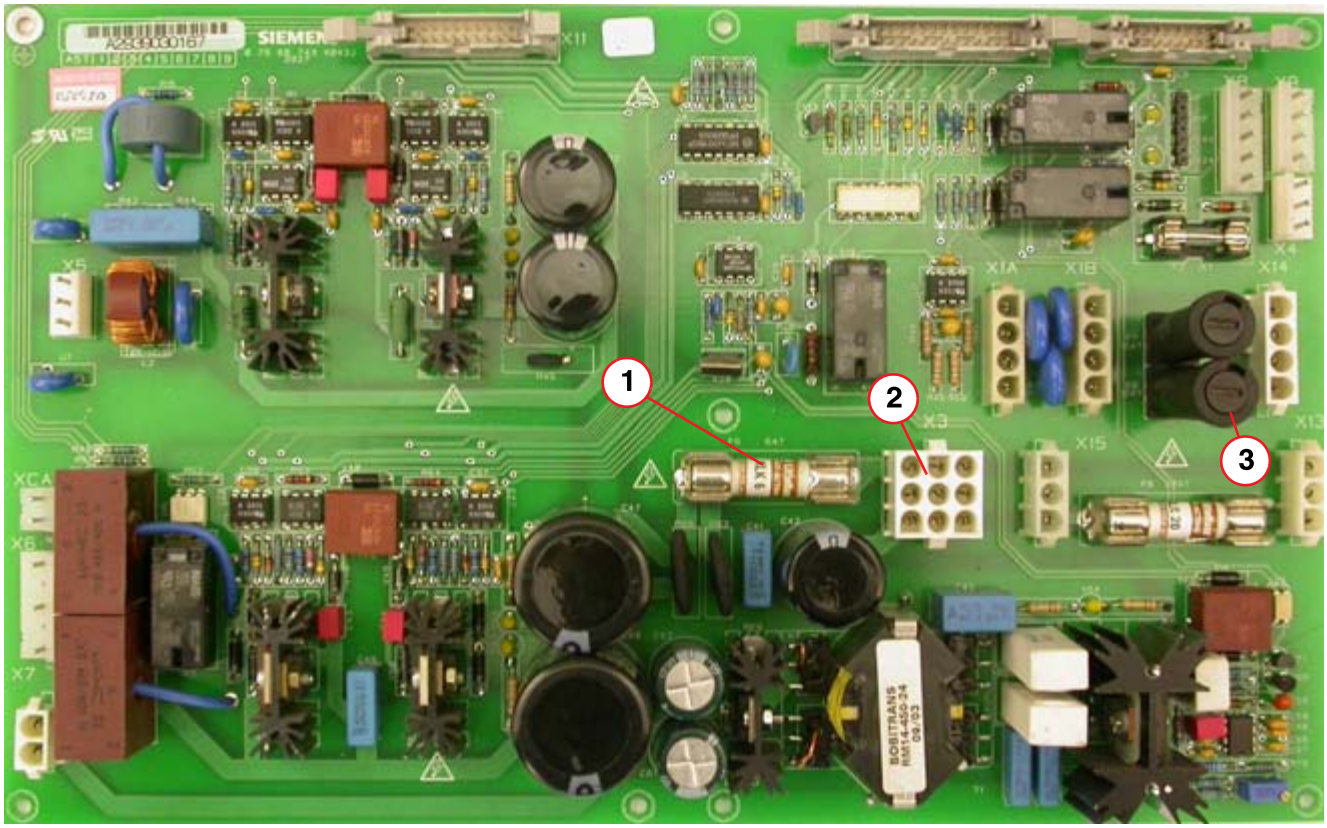

Fig. 10: D927

Pos. 1 F5
Pos. 2 X3
Pos. 3 F7/F8

D916 (CPU)

Replacing D916

NOTE

After replacement of components D916, D962, or the single tank, the filament current (IH) must be adjusted on D916 (CPU).

- Switch off the system and possibly disconnect the power plug.
- Remove the top cover and, in the case of the MOBILETT XP Digital, place it on its side on a table or similar surface.
- Move switch SW2B on D916 to 2 (service program) and switch the system on.
- Read out all customer programming and make a note of it. To do this, use the service programs (refer to Troubleshooting Instructions SPR8-230.840.01...).
- Switch off the system.

- Remove the metal plate over board D916. For MOBILETT XP Digital, remove the CXDI PC (laptop) and additionally remove the holder plate.
- Disconnect all lines of D916.
- Remove firmware J38 and set it aside for the new board .
- Also save RAM J40 as needed.
- Unscrew D916 (CPU) and insert the new D916 (CPU). Reconnect all cables.
- Insert firmware (and RAM battery if necessary).
- Set the filament current (I_H) as subsequently described in the "D916 settings" (filament current) section of these instructions.
- After successfully setting the filament current, install the metal covers of D916 and possibly the holder plate and the CXDI PC (laptop) with all cable connections.
- Move the D916 SW2B switch to 2 (service program) and switch the system on.
- Set the previously noted customer programming. To do this, use the service programs (refer to Troubleshooting Instructions SPR8-230.840.01...).
- Move the D916 SW2B switch to 1 (user) and switch the system off and back on.
- Start the CXDI PC for the MOBILETT XP Digital (digital mode).

- Perform a functional check.
- Switch the system off and remove all covers.

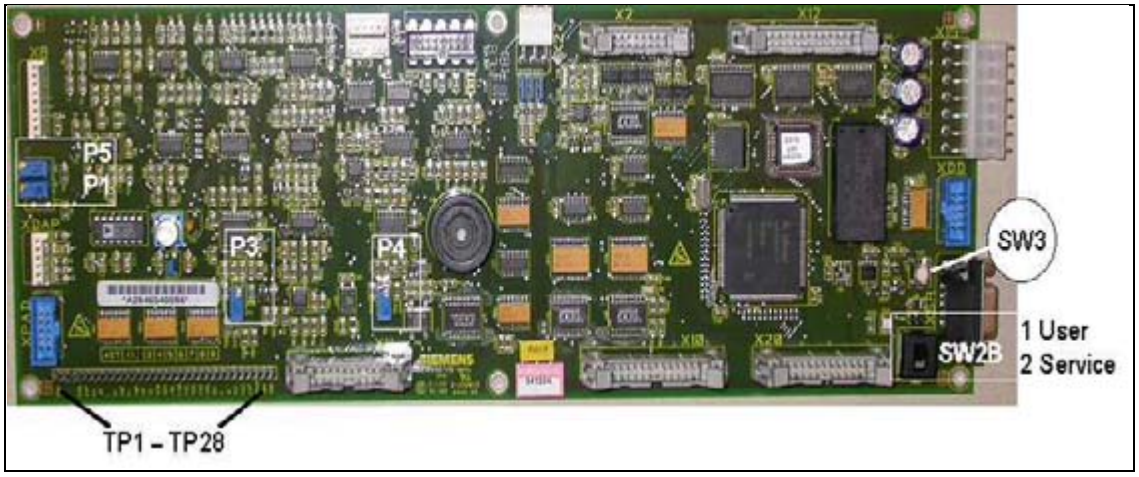

Fig. 11: CPU D916

D916 settings

Main inverter, maximum frequency (50kHz)

The settings are made via the 2-channel oscilloscope and potentiometer P4 of D916 (CPU).

- Switch off the system.
- Remove the top cover and, in the case of the MOBILETT XP Digital, place it on its side on a table or similar surface.
- Remove the metal plate over board D916. For MOBILETT XP Digital, remove the CXDI PC (laptop) and additionally remove the holder plate.
- Oscilloscope channel 1 at D916 TP “FC2” (26) and D916 TP “GND” (1).

  Oscilloscope setting: 1 V/div, sweep 5 µs/div.
- Move switch SW2B on D916 to 2 (service program) and switch the system on.
- Select service program 7 (adapting the main inverter frequency).
- Use exposure switch S27 to press "PREP" and hold.
- Set the resonance frequency of the main inverter with potentiometer P4 on D916 to 50 kHz +/- 0.3 kHz.

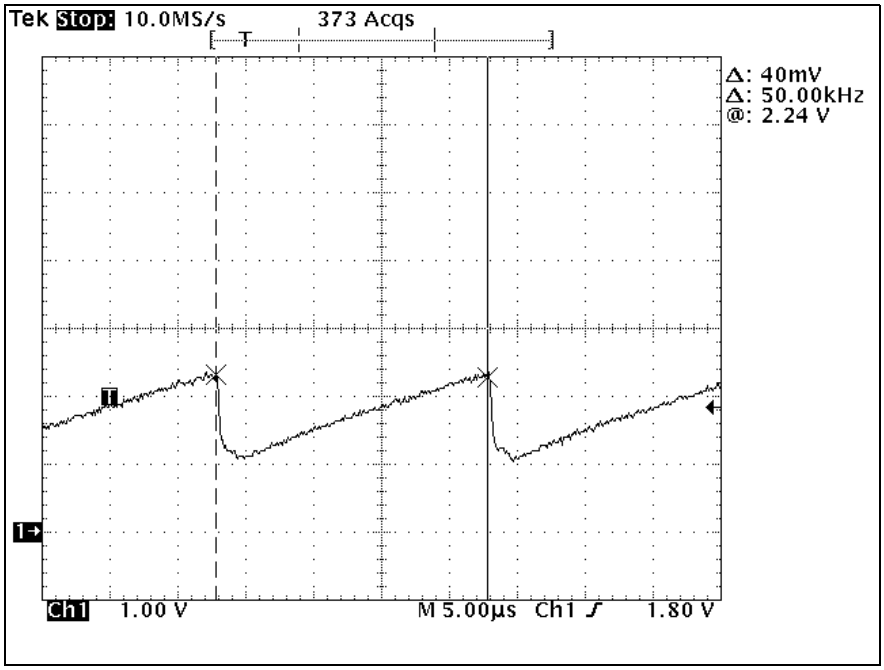

Fig. 12: FC2_50kHz

Filament inverter, maximum frequency (75kHz)

The settings are made via the 2-channel oscilloscope and potentiometer P3 of D916 (CPU).

- Switch off the system.
- Remove the top cover and, in the case of the MOBILETT XP Digital, place it on its side on a table or similar surface.
- Remove the back cover of the MOBILETT XP. (Access to D927)
- Remove the metal plate over board D916. For MOBILETT XP Digital, remove the CXDI PC (laptop) and additionally remove the holder plate.
- Oscilloscope channel 1 at D916 TP “FC1” (25) and D916 TP “GND” (1).

  Oscilloscope setting: 1 V/div, sweep 5 µs/div.
- Remove the protective cover of D927 Caution! It is possible to come into contact with components under voltage!
- Remove plug X5 of board D927 (breaking the filament circuit).
- Move switch SW2B on D916 to 2 (service program) and switch the system on.
- Select service program 9.
- Use exposure switch S27 to press "PREP" and hold.
- Set the resonance frequency of the filament inverter with potentiometer P3 on D916 to 75 kHz +/- 2 kHz.

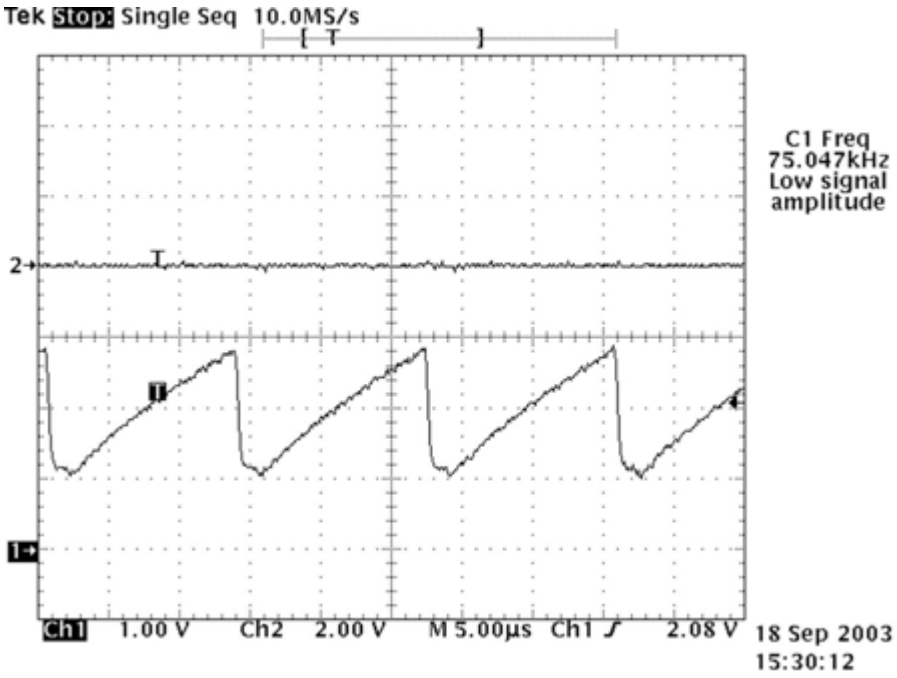

Fig. 13: Test point FC1 75 kHz

Filament current I_H

The settings are made via the 2-channel oscilloscope and potentiometer P5 of D916 (CPU).

Basic setting I_H

- Switch off the system.
- Remove the top cover and, in the case of the MOBILETT XP Digital, place it on its side on a table or similar surface.
- Remove the metal plate over board D916. For MOBILETT XP Digital, remove the CXDI PC (laptop) and additionally remove the holder plate.
- Oscilloscope channel 1 at D916 TP “I” (7) and D916 TP “GND” (1) - resonant filament current.

  Oscilloscope setting: trigger channel 1, trigger stage 1 V, 2 V/div, sweep 100 µs/div
- Move switch SW2B on D916 to 2 (service program) and switch the system on.
- Select service program 9 (heating test) (D916/SW2B).
- Use exposure switch S27 to press "PREP" and hold.

- Preset the resonance frequency of **I_H** using potentiometer P5 on D916.

  Set the basic setting of I_H to 7.5 kHz ± 1kHz. (P5 in clockwise direction = increase, period length T corresponds approximately to 133 µs.

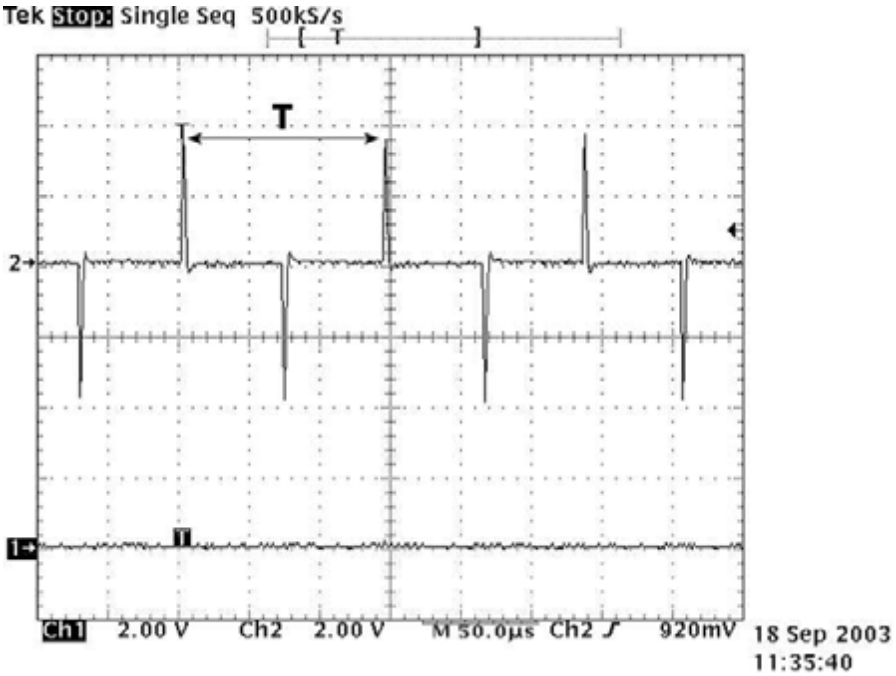

Fig. 14: IH_Prep_7.5kHz

Exposure heating

- Oscilloscope channel 1 at D916 TP “JR” (6) and channel 2 at D916 TP “IH” (8), D916 TP “GND” (1).

  Oscilloscope setting: Trigger channel 2, trigger stage 1.5 V, 1 V/div, sweep 5 ms/div

- Select 81kV / 5mAs and release an exposure. (Manual mode for MOBILETT XP Digital)
- Adjust the tube current for an even run via D916.P5 (counter-clockwise = I_H reduction).
  - ➪ See example (Fig. 15 / p. 31).
  - ➪ Correction values for the entire kV/mAs range are automatically calculated with this basic setting of D916 (CPU). No further settings are required.
  - ➪ If applicable, also consider the measured values for kV. If the filament current is too high, the set kV values are not reached or are asymmetric (ERR 34). Start in this case with the basic filament current setting.

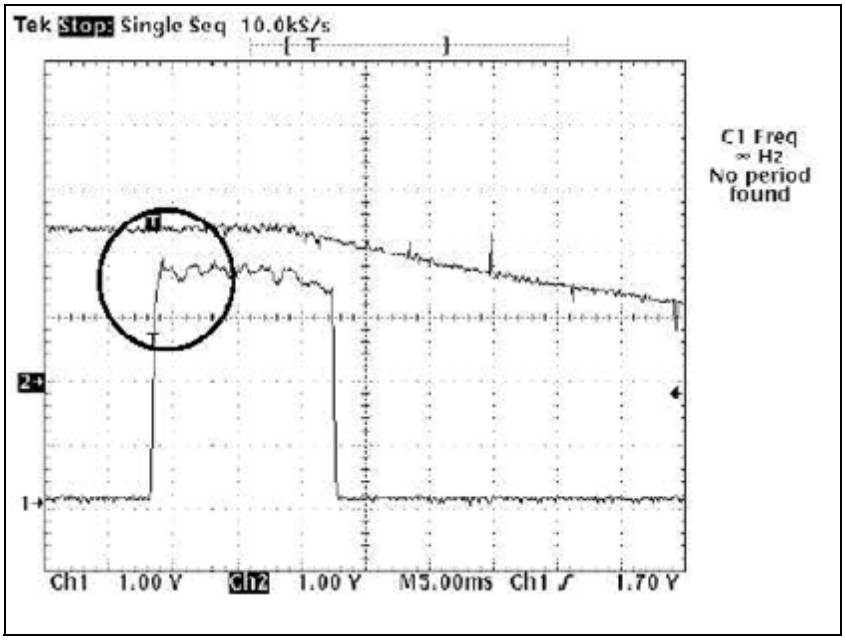

Fig. 15: Filament current ok

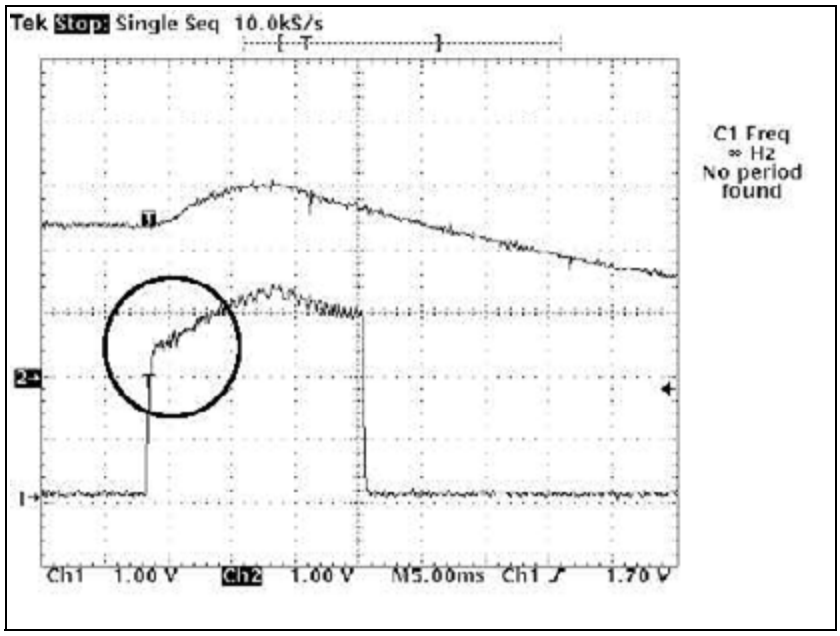

Fig. 16: Low filament current

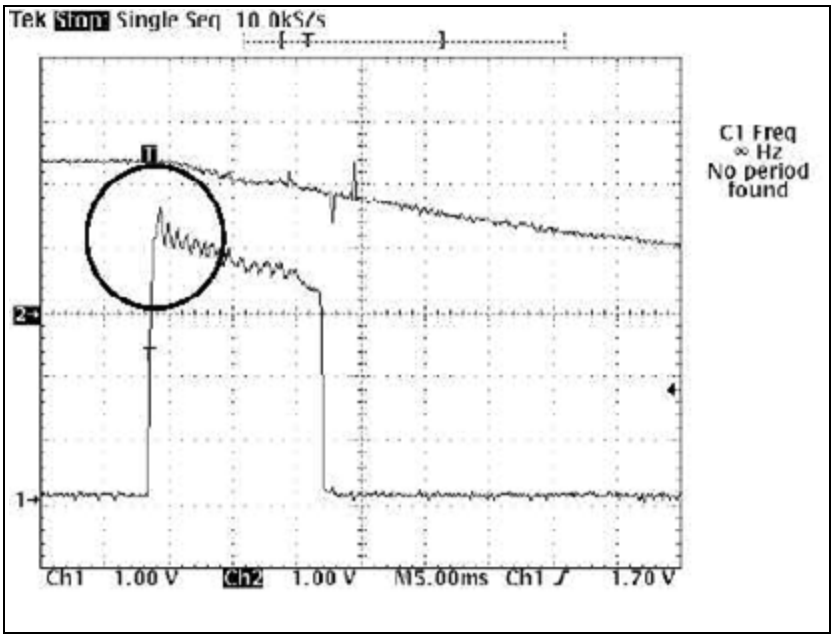

Fig. 17: High filament current

D908 (control panel, XP/ Hybrid/ Eco)

- Remove the top cover.
- Open the cover of the user interface and pull off all cables.
- Unscrew and replace the board. Reconnect the cables.

NOTE	**D908 is identical in XP (Eco) and Hybrid. The battery indicator is not active in XP (Eco).**

Fig. 18: D 908 control panel

D909 (manual control panel, XP Digital)

- Remove the top cover and place it on its side on a table or similar surface.
- Disconnect all lines of D909 from the inside of the top cover.
- Unscrew and replace the complete control panel. Reconnect the cables.

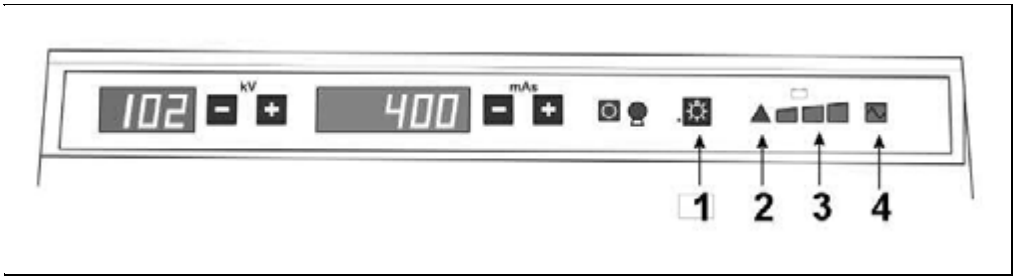

Fig. 19: Battery status display

D917 (galvanic separation)

Replacing D917

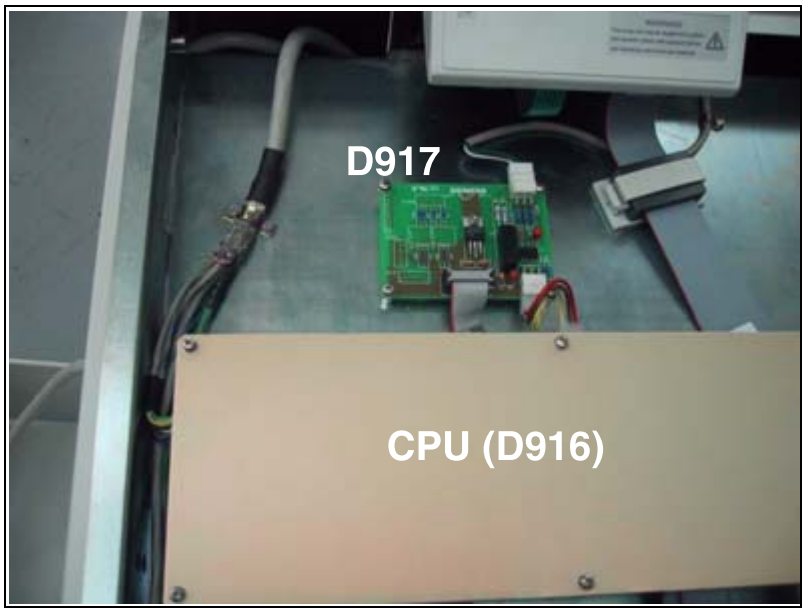

Fig. 20: D 917

- Switch off the system and possibly disconnect the power plug.
- Remove the top cover and, in the case of the MOBILETT XP Digital, place it on its side on a table or similar surface. Do not disconnect any cables from the MOBILETT XP Digital.
- For MOBILETT XP Digital, remove the CXDI PC (laptop) and additionally remove the holder plate.
- Disconnect all lines of D917.
- Unscrew D917 and insert the new D917. Reconnect all cables.
- Install the holder plate and the CXDI PC (laptop) with all cable connections.
- Switch on the system and perform a functional check.

  ➪ Release switch S27, the motor drive, and the remote control and DAP options are guided via D917. Test S27 and all available options for proper functioning.
- Switch the system off and remove all covers.

Adjusting D917

- This board is adjusted at the factory - no setting is required.

D927 (power supply)

Removing D927

- Switch off the system and possibly disconnect the power plug.
- Open the back covers.
- Pull out the "power box with power supply U3" module of the MOBILETT XP Digital.
- Remove the safety cover in front of the board.
- First disconnect plug X3 (capacitor charger). (CAUTION: 440 V DC at F5! Wait 15 min. and measure the voltage at F5).
- Disconnect all other cables.
- Unscrew and replace the board. Reconnect all cables (X3 last).
- Install the safety cover again.
- Switch on the system and perform a functional check.
- Switch the system off and remove all covers.

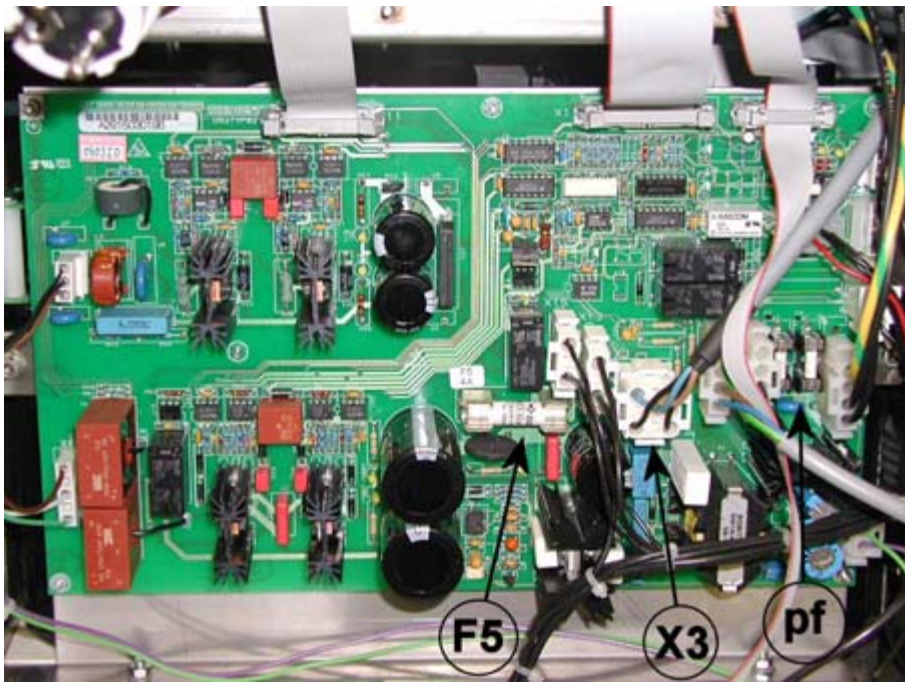

Fig. 21: D927 overview

Adjusting D927

- This board is adjusted at the factory - no setting is required.

U1/U2 (direct voltage power supply units)

Removing U1/U2

- Switch off the system and possibly disconnect the power plug.
- Open the covers on the upper, rear and right-hand side (U1/U2 are located on the right of the system).
- Remove the safety cover in front of U1/U2.
- Verify that the U1/U2 modules are voltage-free.
  - ➪ Voltage may be present in the cooling guide plates of the U1/U2 modules.
- Disconnect all cables.
- Unscrew and replace the board and then reconnect the cables.
- Install the safety cover again.
- Switch on the system and perform a functional check.
- Switch the system off and remove all covers.

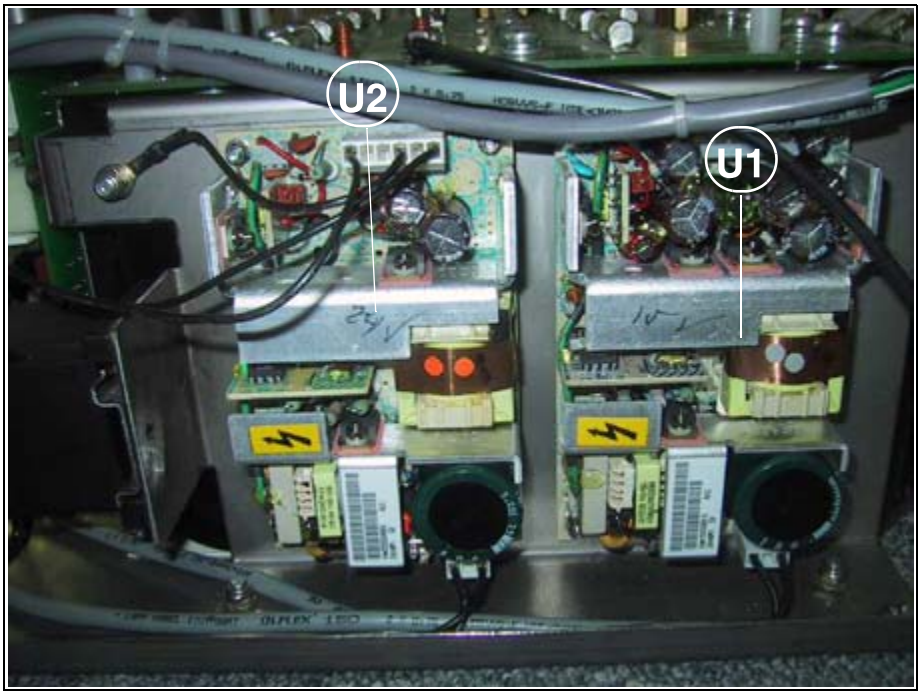

Fig. 22: U1 / U2 direct current supply

Adjusting U1/U2

- The boards are adjusted at the factory - no setting is required.

Capacitor bank (D952/D962/D972/C1-C12)

NOTICE

Never short out the capacitors to discharge them if they are installed in the unit.

The D972 fuses can easily sustain irreversible damage.

➪ **For manual discharge, always use the discharge resistor R6.**

Capacitor bank check

NOTE

Fig. (Fig. 23 / p. 38) shows D972 on the top of the capacitor bank as a removed component. When installed, yellow LEDs V1-V12 are visible only from both sides.

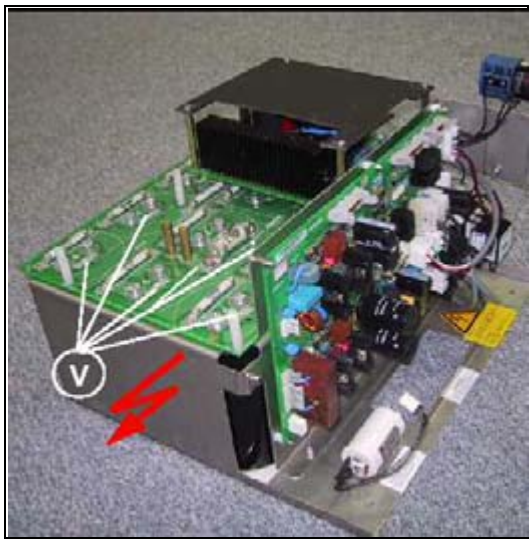

Fig. 23: D972_LED V1_12

The capacitor bank is discharged via discharge resistor R3/4/5 after the system is OFF. The capacitor bank discharges to < 40 V in approx. 15 minutes. The safety covers can be removed after this period has elapsed. If one of these LEDs is dark, the associated capacitor or the fuse is defective. In this instance, there is a risk of the capacitor charging until all the repairs have been completed correctly.

- Measure the residual voltage at measurement points on board D927, "fuse F5 and the metal frame" (GND/F5/Fig. 24 / p. 39). Discharge from max. 440 V to < 2 V takes approx. 15 to 20 minutes.
- The measured voltage must be < 2 V > 0 V DC.

Fig. 24: Alignment D927 capacitor voltage at F5_Measure ground

⚠ DANGER

There is a risk of life-threatening electrical shock.

If the voltage measured between the fuse on board D927-F5 and ground is 0 V, the measurement is incorrect!

Disregarding the safety instructions will lead to death or serious bodily injury.

➪ **Observe the general and product-specific safety information and do not touch any potentially dangerous parts. Secure the work area so that no other living beings are endangered.**

- Charging voltage = 0 V: Check the measuring instrument and measuring setup.
- Disconnect the power supply of the capacitor charging device on D927 via plug X3.
- Check fuse "F5 - D927". If the fuse has blown: Replace the fuse only with plug X3 disconnected.
- Reconnect X3 and repeat the measurement.
- Connect the line power again and switch the system on.
- - Measure the capacitor voltage at D916 (CPU) TP "VC" (1 V ^ 100 V).

  - Check V1-V12 on D972 (visual inspection).
- Switch the system off and wait until the capacitor bank has discharged to <2 V >0 V.

Complete removal of the capacitor bank (D952/ D962/ D972/ C1-12)

The complete capacitor bank must be removed to replace D952, D962, D972 or one or several capacitors.

⚠WARNING

Risk of injury while removing the capacitor bank from the system.

- Heavy capacitor bank = 30 kg!

- Be aware of the possible residual capacitor charge!

Death or serious bodily injury can occur.

- ➪ **Take appropriate action to ensure that removing the heavy unit does not cause injury.**
- ➪ **Make sure the unit does not fall and damage other components.**

⚠ DANGER

When removing the capacitor bank, there is a danger of a residual charge from individual capacitors of up to 300 V DC.

- ➪ **Make sure that they are voltage-free.**
- ➪ **Proceed with extreme caution when handling components. Follow all safety instructions.**
- ➪ **Sturdy work gloves are recommended as specified in the general safety guidelines.**

- Switch off the system and possibly disconnect the power plug.
- Wait 15 min. until the capacitor bank is discharged.
- Open the covers on the top, back, left, and right side.
- In the case of the MOBILETT XP Digital, pull out and remove the "power box with power supply U3" module and place it on its side.
- Remove the safety cover in front of U1/U2.
- Verify that the U1/U2 modules are voltage-free.
  - ➪ Voltage may be present in the cooling guide plates of the U1/U2 modules.
- Remove the safety covers in front of D927.
- Allow the capacitors 15-20 min. to discharge and the check the residual voltage at the capacitors.
  - ➪ Measure the current intermediate circuit voltage of the entire capacitor bank C1-C12.
    - At fuse F5 connect D927 to GND!
- Disconnect all relevant cables in the sequence specified in the table:

Cables for the capacitor bank					
1.	X3 on D927	6.	X5 on D927	11.	X14 on D927
2.	X20 on D916	7.	X6 on D927	12.	K2 on U1 (right)
3.	C1 front left	8.	X7 on D927	13.	GND frame over U2

4.	KR1 front left	9.	X10 on D927	14*	X9 on D952 (front right)
5.	X2 on D927	10.	X11 on D927	---	----------

*14: Once this plug is unplugged, the capacitor discharge resistors are disconnected. (X9/Fig. 27 / p. 42)

- Secure all loose cable ends of other components so they do not pose a hindrance or hazard during removal and installation.
- Check the hand brake, and block the wheels if necessary.
- Loosen the mounting screws of the capacitor bank (AS/Fig. 25 / p. 41).
- Remove the capacitor bank.
  - ➪ Be prepared for its significant weight! (Fig. 28 / p. 42)
  - ➪ Be aware of the possible residual charge (voltage > 40 V DC) of individual capacitors!

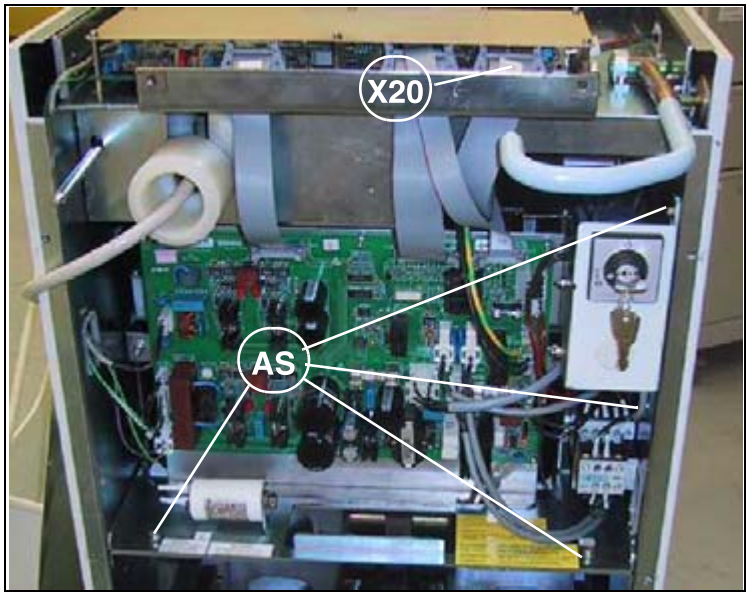

Fig. 25: Capacitor bank attachment

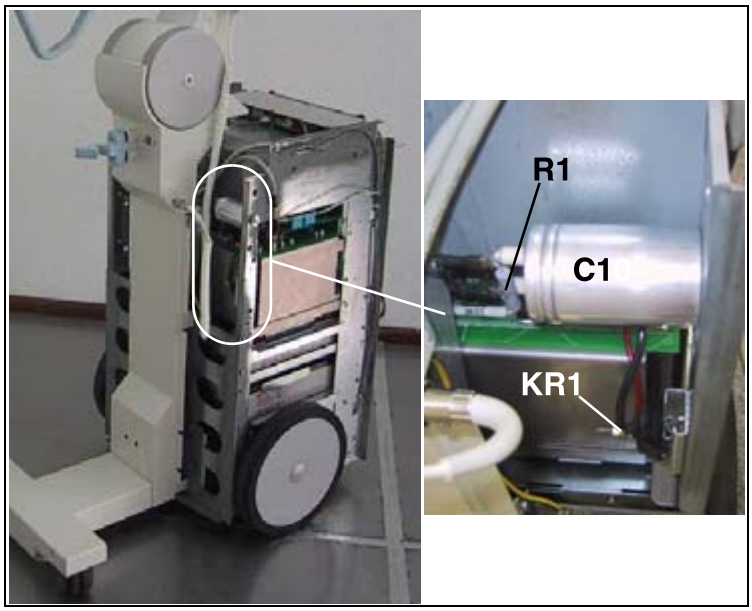

Fig. 26: Left front

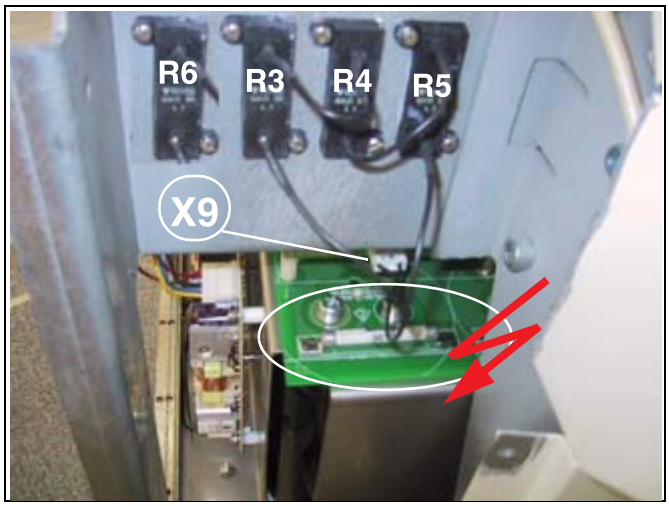

Fig. 27: Right front

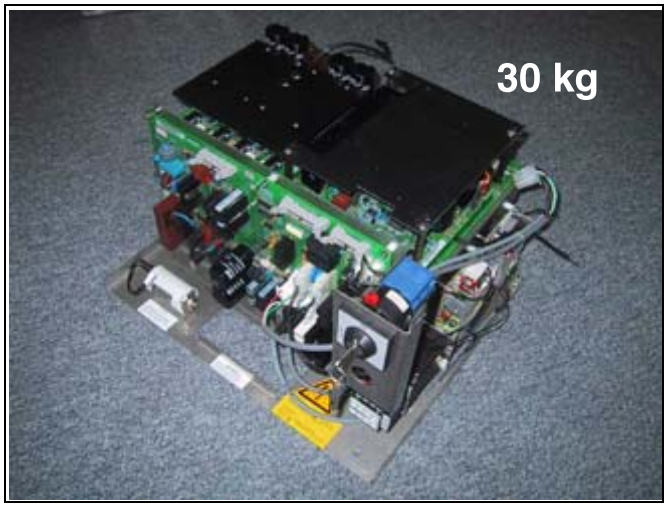

Fig. 28: Capacitor bank dismantled

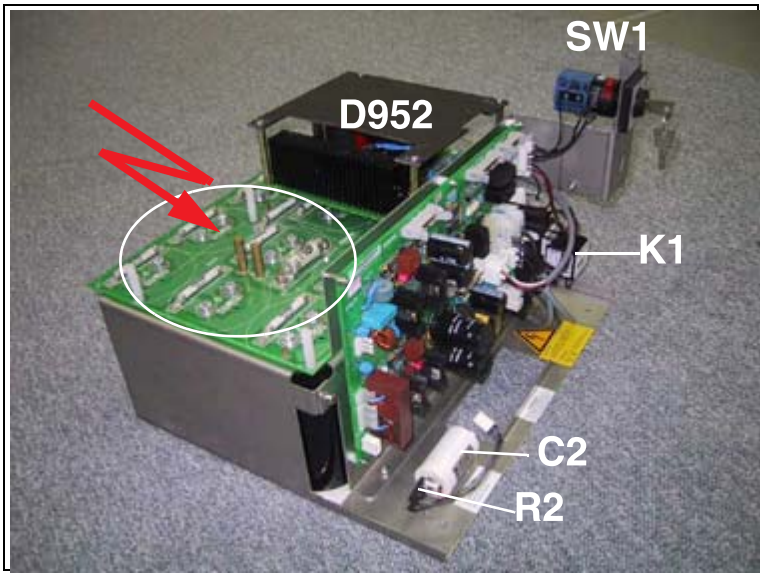

Fig. 29: Replacing D 962

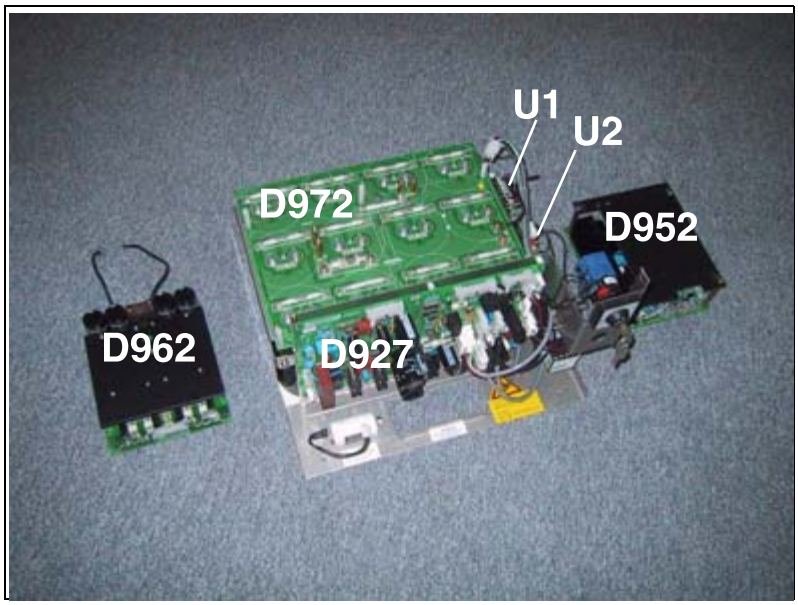

Fig. 30: Capacitor bank - D 972

Removing D952 (capacitor charger)

The capacitor bank has already been removed.

- If possible, measure the voltage at the capacitor connection screws of board D972 and at the connection screws of D952 (+/-/Fig. 31 / p. 44).
  - ➪ If residual charges > 2 V exist, individual capacitors can be manually discharged via R6 (R6/Fig. 27 / p. 42).
- Loosen the two contact points (+/-/Fig. 31 / p. 44) of board D952.
- Loosen the three mounting screws (1/Fig. 31 / p. 44) and replace the board.
- First tighten the three mounting screws and then the two connection screws - reconnect the "Minus" cable (-/Fig. 31 / p. 44).

- Before inserting the capacitor bank, verify that the system is completely immobile (hand brake).
- Repeat all steps for removing the capacitor bank in the reverse order until the capacitor bank has been properly reinstalled and all of the cables are connected.
- When connecting, first start with X9 (cable for "discharge resistors" X9/(Fig. 27 / p. 42)).
- Reinstall all safety covers.
- Switch on the system and perform a functional check.
- Switch the system off and remove all covers.

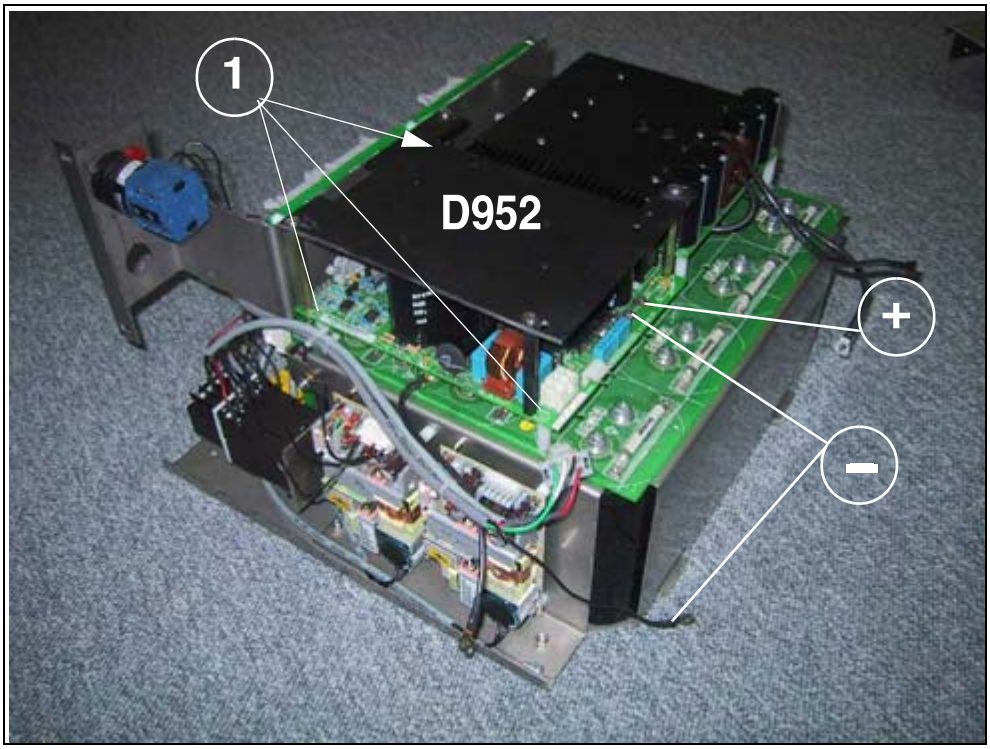

Fig. 31: D952_capacitor charger_ _01

Adjustment of D952

- This board is adjusted at the factory - no setting is required.

Removing D962 (kV inverter)

NOTE	**After replacing components D916, D962, or the single tank, the filament current (I_H) must be adjusted on D916 (CPU).**

The capacitor bank has already been removed.

- If possible, measure the voltage at the capacitor connection screws of board D972 and at the connection screws of D962 (1/Fig. 32 / p. 45).
  - ➪ If residual charges > 2 V exist, individual capacitors can be manually discharged via R6 (R6/Fig. 27 / p. 42).

- Loosen the two contact points (1/Fig. 32 / p. 45) for board D972.
- Loosen the four mounting screws (I/Fig. 32 / p. 45) and replace the board.
- First tighten the four mounting screws and then the two connection screws (1/Fig. 32 / p. 45).

NOTE

Upon reassembly, the black connector cable between D962 (screwed onto the underside) and capacitor C1 must be routed through the current transformer of the new D962.

- Before inserting the capacitor bank, verify that the system is completely immobile (hand brake).
- Repeat all steps for removing the capacitor bank in the reverse order until the capacitor bank has been properly reinstalled and all of the cables are connected.
- When connecting, start with X9 (cable for "discharge resistors" X9/(Fig. 27 / p. 42)).
- Reinstall all safety covers.
- Switch on the system and perform a functional check.
- Switch the system off and install all covers.

Fig. 32: D962 kV_inverter_01

Adjustment of D962

- This board is adjusted at the factory - no setting is required.
- It is necessary to set the single tank filament current. See "D916 settings" in these instructions.

Removing D972 (capacitor board)

The capacitor bank has already been removed.

- Then perform the work steps "replacement of D952 and D962" until both boards have been removed.
- Measure the voltage of the individual capacitors at the terminals.
  - ➪ If residual charges > 2 V exist, individual capacitors can be manually discharged via R6 (R6/Fig. 27 / p. 42).
- Check the fuses on D972. If a fuse is blown, the corresponding capacitor must be measured.
- Unscrew all capacitors and remove the defective board.
- Take the connection bolts for D952 and D962 from the old D972 and use them for the new D972. (1/Fig. 33 / p. 46).
- Before installing the new D972, measure all capacitors to make sure that the voltage is approx. 0V. If necessary, discharge with R6.
- After all 12 capacitors have been fastened, check all fuses on the board.
- Before installing the D952 and D962 boards, check once more to ensure that there is no voltage at the connnection bolts of the D972. If necessary, discharge with R6.
- Now repeat all steps in the reverse order until the capacitor bank has been properly reinstalled and all of the cables connected.
- Reinstall all safety covers.

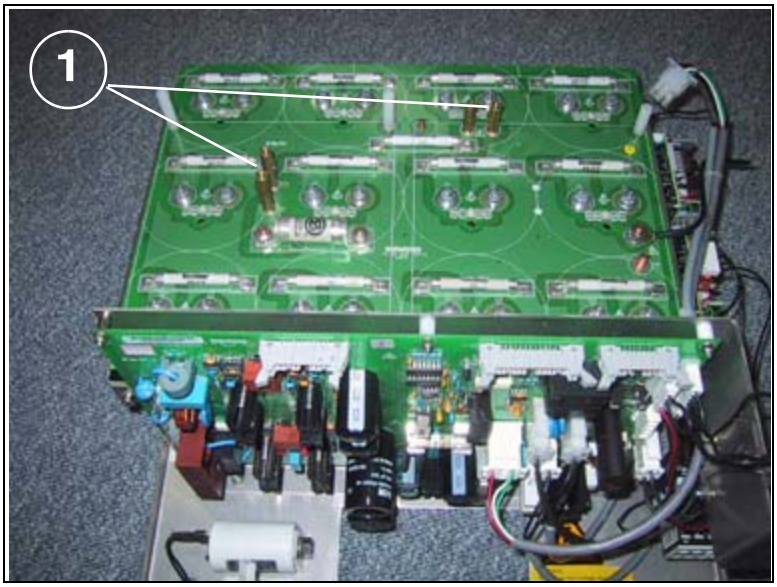

Fig. 33: D 972 board of the capacitor bank

Adjustment of D972

No settings are required for this board.

- Switch the system on and check all 12 LEDs (V1-V12) on the capacitors.
- Measure the charged voltage at D916 TP- VC (1V^100V / nominal = 4.4V^440V).
- Check the "filament current I_H" setting and adjust it if necessary (see the "D916 settings, filament current I_H" section of these instructions).

- Perform a functional test.
- Install all covers and perform a functional test.

C1 - C12 (12 x 10mF / capacitor bank)

- The capacitor bank has already been removed.
- Subsequently perform all work steps up to the removal of D972 (do not unscrew the capacitors).
- Measure at the terminals of each capacitor to make sure the voltage is approx. 0V in each case. Discharge with R6 if necessary (R6/Fig. 27 / p. 42).
- Unscrew the rear metal plate with D927 fitted.
- Unscrew the right-hand metal plate with U1 and U2 fitted.
- Only loosen (do not remove) the screws of the defective capacitor (or capacitors).
- Pull the complete capacitor package out of the metal frame. Bear in mind that the 12 capacitors on the board are extremely heavy. Always exercise care when moving the assembly to avoid breakage of D972.
- Place the complete package on one side and then unscrew the defective capacitor.
- Before installing the new capacitor, measure to make sure that its voltage is approx. 0V. If necessary, discharge with R6.
- Install the new capacitor and reinsert the package in the metal frame.
- For safety during transport and disposal, provide the defective capacitor with a permanent short-circuit.
- Now repeat all steps in the reverse order until the capacitor bank has been properly reinstalled and all of the cables connected.

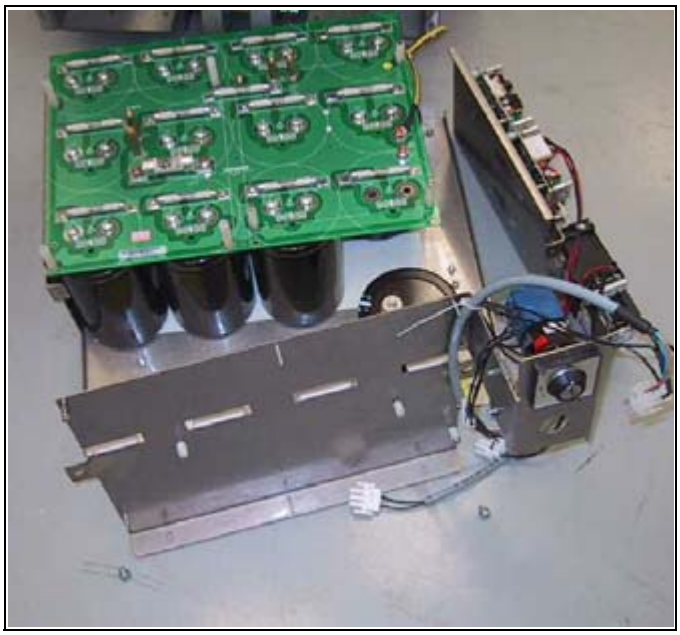

Fig. 34: Replacing the capacitor

Fig. 35: Replacing the capacitor

Adjustment of C1 - C12

If a capacitor has been in storage for a long time, it may need to be formatted (ERR 13 possible). Service program 01 must be started for this purpose. This takes approx. one hour.

- Measure the charged voltage at D916 TP- VC (1V^100V / nominal = 4.4V^440V).
- Check the "filament current I_H" setting and adjust it if necessary (see the "D916, filament current I_H" section of these instructions).
- Perform a functional test.
- Install the covers and perform a functional test.

Board battery operation and motor control (Hybrid/Digital)

NOTE

The MOBILETT may be switched on only when all battery packs BK1-BK4 are connected to D982.

If the unit is switched on with one or more battery packs unplugged, fuse F3 and/or F4 on the D982 will trip.

D982 (battery chargers)

- Switch off the system and possibly disconnect the power plug.
- Open upper and rear covers.
- First disconnect the battery plug, then remove the plastic safety cover and disconnect all other cables.
- Unscrew the board with the complete metal plate, replace the board and reconnect the cables.
- Attach the plastic safety cover.

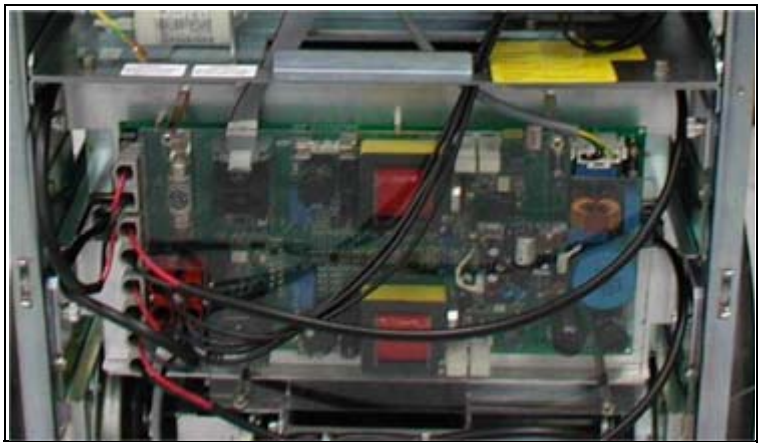

Fig. 36: D982 battery charger (covered)

Fig. 37: D 982 battery charger without cover

Adjustment of D982

- This board is adjusted at the factory - no setting is required.
- Connect the power plug, perform a functional test of the charging process, and check the LEDs (see the "Overview - LEDs, fuses, potentiometers" section of the Trouble-shooting Instructions).

- Install the covers and perform a functional test.

Battery blocks (BK1/2 & BK3/4)

NOTE	**An entire block side must always be completely replaced: BK1 & BK2 for "Charger 1" and BK3 & BK4 for "Charger 2".**

- Switch off the system and possibly disconnect the power plug.
- Remove upper and rear covers.
- Remove board D982 (these instructions).
- The battery packs are fastened with two Allen screws each.
- Remove the defective packs.
- Label each new pack with the installation date (e.g., with tape on front panel).
- Insert new packs into fixtures BK1 - BK4. Pay attention to the different cable lengths for D982!
- Install D982, connect all cables and attach the safety cover.

- Connect the power cable and check the charging function using the LEDs on D982 and the user display (see the "Overview - LED, fuses, potentiometers" section of the Troubleshooting Instructions).

NOTE

Do no leave the system unattended without covers during the charging process.

- Disconnect the power cable again and attach all covers.
- Reconnect to the mains and start the charging process. It should be possible to run a complete functional test in the battery operating mode after approx. one hour.

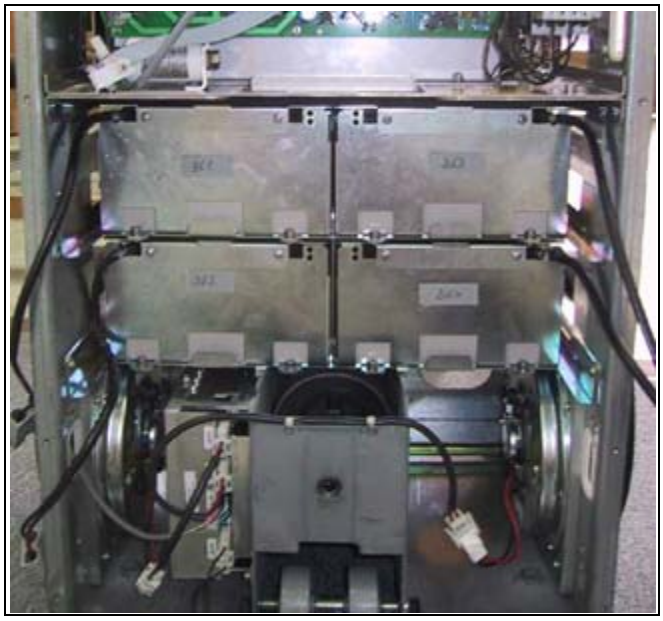

Fig. 38: Installed battery blocks BK1 - BK4

Fig. 39: Single battery block

Adjustment of BK1 - BK4

No settings are required.

- Perform a functional test in the battery mode.

NOTE	**Make sure that the used batteries are disposed of properly.**

D102 (motor control)

- Switch off the system and possibly disconnect the power plug.
- Open upper and rear covers.
- Disconnect all cables to D102
- Unscrew the complete metal housing from D102.
- Loosen the six mounting screws and replace the board.
- Insert and connect the new D102.

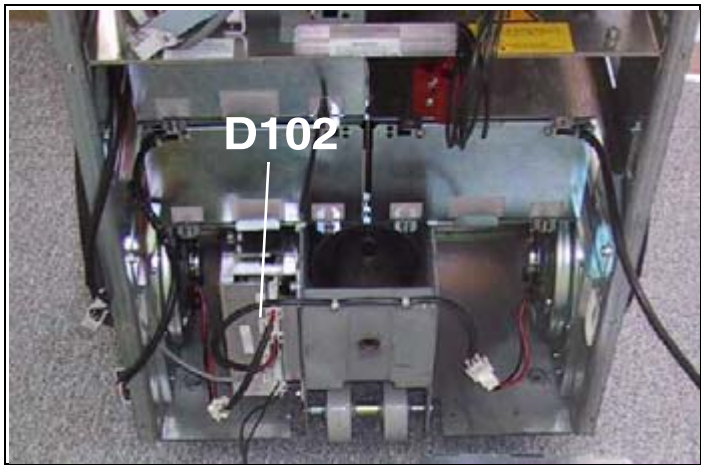

Fig. 40: D102 inside

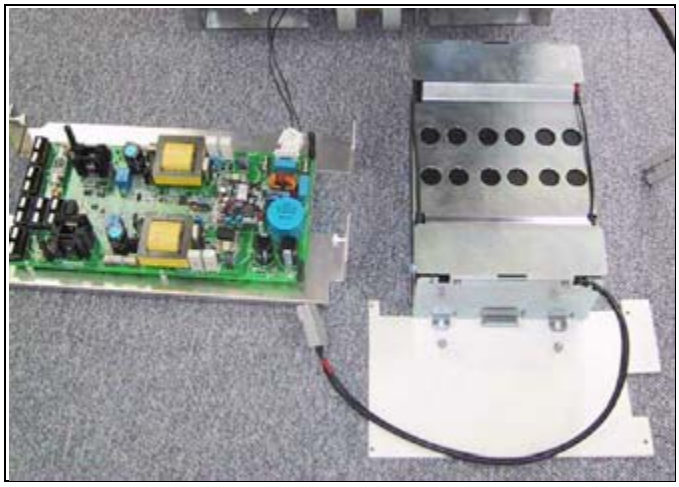

Fig. 41: D102 removed

Adjustment of D102

No settings are required.

Re-attach the covers and perform a functional test in the battery mode.

Adjusting the articulated arm

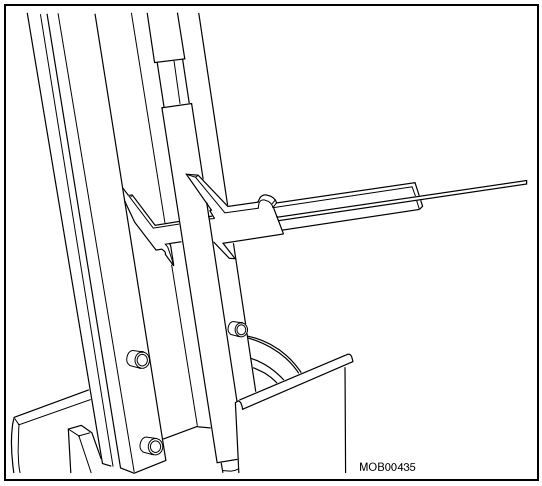

Fig. 42: Adjusting rod

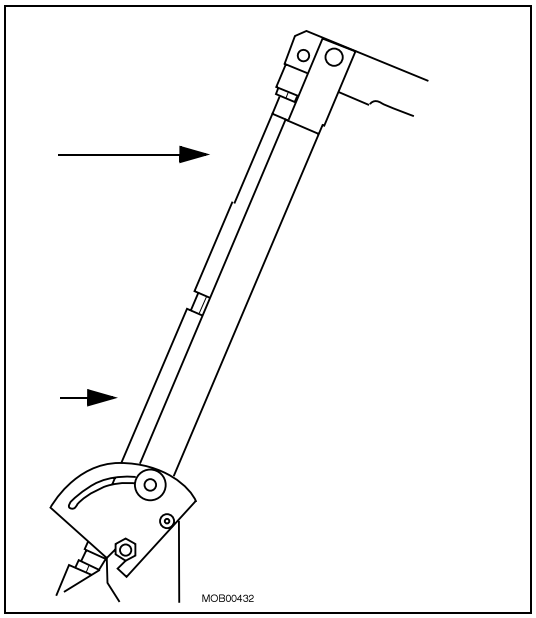

Fig. 43: Measuring rod

Parallelism

Required equipment:	A caliper and a rope. If the parallelism has to be adjusted, a ceiling beam is required.

The adjustment of the parallelism influences the maximum height and the weight compensation. Therefore, this process must be performed before all other adjustments of the articulated arm system.

Remove the arm and joint covers so that the adjusting rod is visible (Fig. 42 / p. 54).

The adjusting rod must always be parallel to the arm.

Test:

- Measure at two points that are as far apart as possible (ensure that the test points have the same diameter at the adjusting rod) (Fig. 43 / p. 54). The parallelism may not deviate > 0.6 mm.

Perform each measurement at the top and bottom position of the arm. If the parallelism deviates from the permissible values, loosen the locking nuts and readjust by turning the adjusting rod.

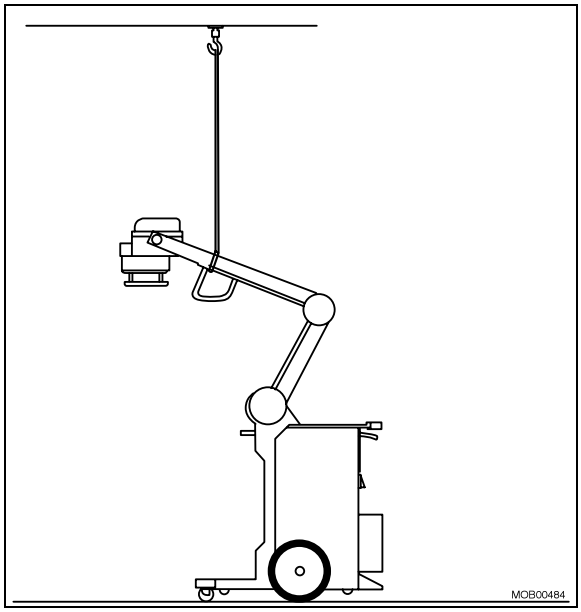

Fig. 44: Ceiling stand

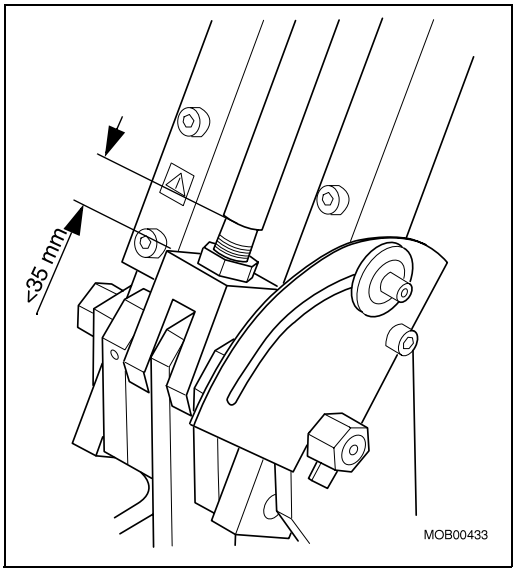

Fig. 45: 35 mm adjusting rod

⚠ DANGER

Risk of injuries!

If the visible part of the thread between the connecting piece and the handle of the adjusting rod is longer than 35 mm, the support arm may sag with the single tank.(Fig. 45 / p. 55).

- **Prior to performing an adjustment, the single tank should be secured in its top position to a ceiling beam(Fig. 44 / p. 55).**
- **After the single tank has been secured, the two lock nuts can be loosened and the adjusting rod can be turned.**
- **Secure the adjusting rod via the lock nuts and repeat the parallelism test until the value is in the permissible range.**

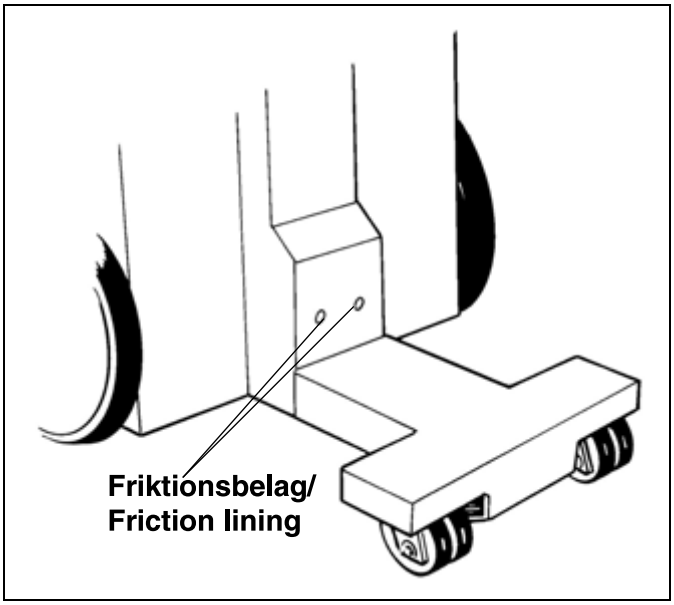

Fig. 46: Stability of the upper support arm

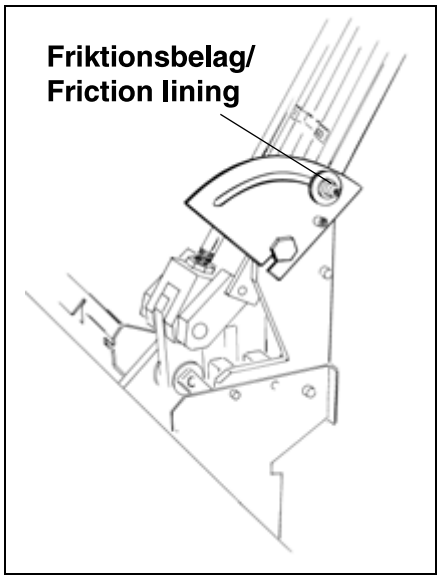

Fig. 47: lo_arm_stability

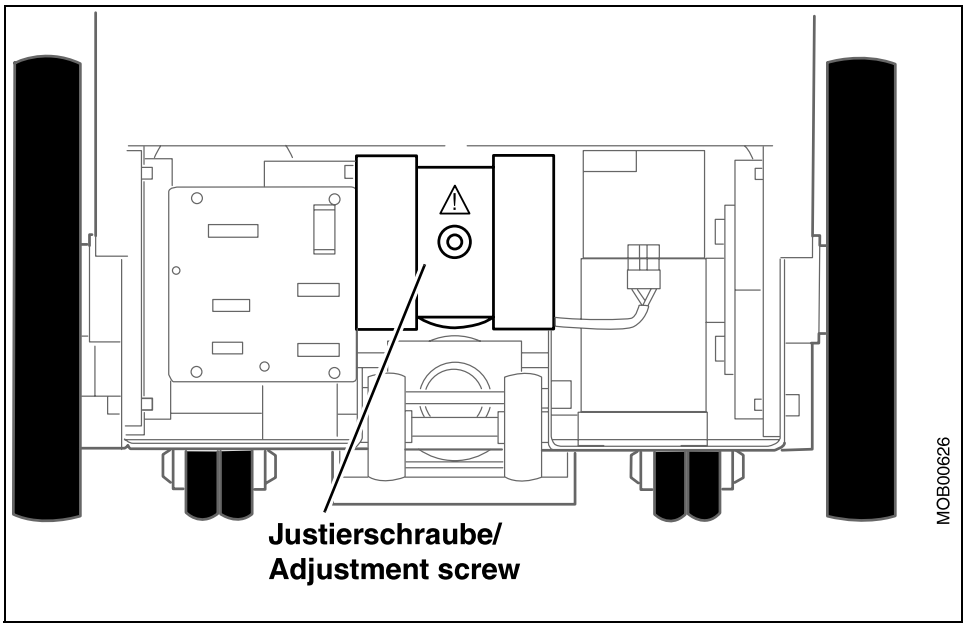

Fig. 48: Adjusting the counterweight

Counterweight

- Remove the plastic plugs that cover the friction linings in the column (Fig. 46 / p. 56).
- Loosen the friction linings through the holes in the column (Fig. 46 / p. 56)
- Loosen the friction lining on the lower articulation (Fig. 47 / p. 57).
- Check whether the arm stops in any position. If it does not stop, but moves up or down:
  - ➪ Adjust the arm system with the adjusting screw (Fig. 48 / p. 57) until it is balanced in any position.
  - ➪ If the arm moves downward, tighten the screw (turn right);
    If the arm moves upward, loosen the screw (turn left);

Adjustment of the friction linings

Upper support arm

If the upper support arm does not stay in the set position, the friction lining can be adjusted through the holes in the cover (Fig. 46 / p. 56).

- Loosen the screws fully with a 4 mm Allen wrench.
- Then tighten the screws again until no there is no longer any noticeable play.
- Tighten the screws uniformly until the upper support arm keeps its position, but can still be moved easily.

Lower support arm

- Remove the screw completely (Fig. 47 / p. 57).
- Then retighten the screw until no there is no longer any noticeable play.
- Tighten the screw until the lower support arm keeps its position but can be moved easily.
- Attach the cover.

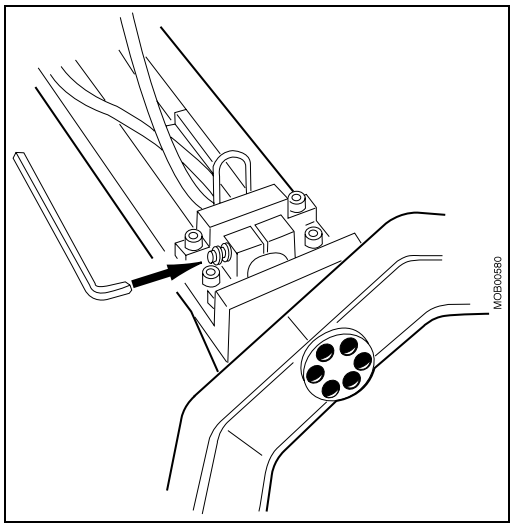

Fig. 49: Adjusting the fork

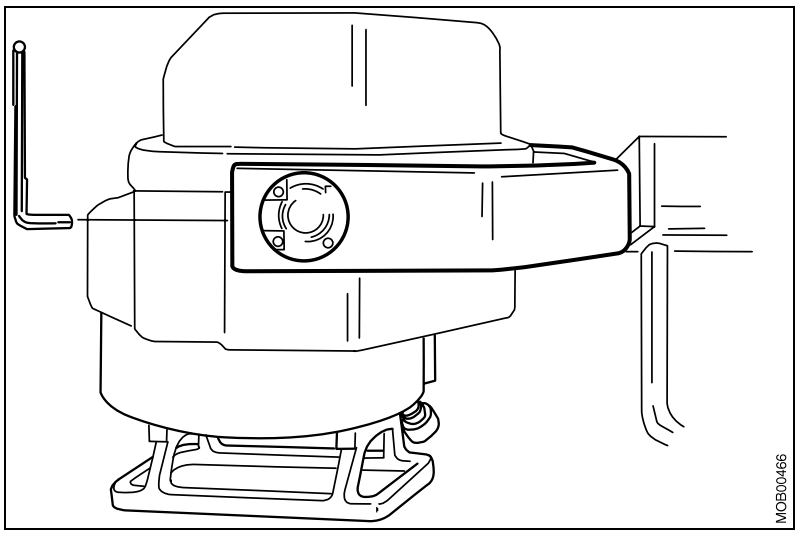

Fig. 50: Adjust_tube_rot

Movement of the fork

If the fork does not hold its position, it must be adjusted (Fig. 49 / p. 58).

- Remove the screw completely.
- Then retighten the screw until no there is no longer any noticeable play.
- Tighten the screw just far enough so that the fork keeps its position.

Movement of the single tank

Perform the following steps if the single tank can be turned too easily or does not keep its position in the fork:

- Remove the caps from the fork.
- Set the friction on both sides of the fork to be tighter or looser. (Fig. 50 / p. 58)

Replacing the spring unit

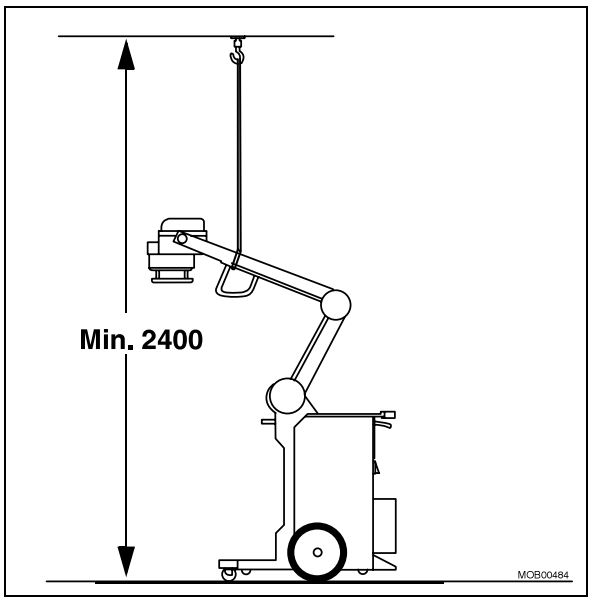

Fig. 51: Releasing the arm

Required equipment: Tightening belt or rope

NOTE

It is advisable to perform this replacement together with a second, trained person.

- Block the back wheels and engage the parking brake.
- Then jack the unit 5 cm above the floor and secure it in this position. Proceed carefully here so that the unit does not tilt over.
- Remove the stand covers.
- Lift the single tank to maximum height and secure it to the ceiling beam (Fig. 51 / p. 60).

NOTE

The ceiling beam must be designed to bear a 100 kg load. The support arm with the single tank may not sink down during the procedure.

⚠WARNING

Risk of injury!

Do not stand under the single tank or the support arm while performing the following work!

➪ **Disregarding this could result in death or injury!**

- Remove the support rollers.
- Place a suitable protective base under the unit so that the floor is not damaged.
- Remove motor power pack D102 and U4 (for Digital).

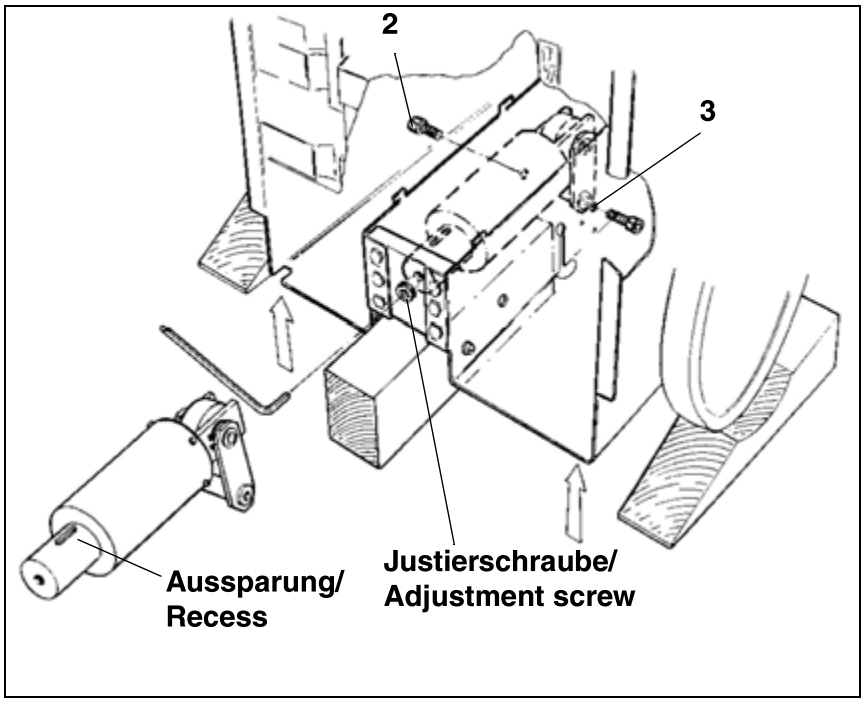

Fig. 52: Spring unit

⚠WARNING

Risk of injury to your hands!

The strong mechanical tension in the spring unit can release uncontrollably.

➪ **Exercise extreme caution when performing the following procedures.**

- Undo the adjusting screw to loosen the spring unit and lower the nearest part of the unit (Fig. 52 / p. 61).

⚠WARNING

If the spring unit cannot be lowered, the springs are too tight.

The strong mechanical tension in the spring unit can release uncontrollably.

➪ **Check to make sure the single tank is in the uppermost position. If necessary, raise the single tank to this position. Check that the adjusting screw is loosened sufficiently. Do not apply any force when removing the spring unit.**

- Loosen both large Allen screws (2 + 3/Fig. 52 / p. 61) on the end of the spring unit. The entire spring unit now sags to the floor.
- Remove the spring unit.
- Install the new spring unit and screw in the two Allen screws (2 + 3/Fig. 52 / p. 61) at the end of the spring unit (do not tighten).

- Raise the front part of the spring unit and look through the hole of the adjusting screw. The front part of the spring unit must be visible together with the opening.
- Reinsert the adjusting screw and tighten until the spring unit is held in position.
- Tighten the screws (2 + 3/Fig. 52 / p. 61).
- Tighten the adjusting screw until the arm and single tank are held in the uppermost position only by spring force.
- Reinstall the castors.
- Remove the ceiling beam carefully and check that the single tank remains in its uppermost position by itself. Otherwise tighten the adjusting screw even more.
- Move the arm into the park position.
- Lower the system to the floor and block the rear wheels.
- Check the movements of the arm and single tank. If necessary, adjust according to the "Adjustments of the articulated arm system" section.
- Replace or install all covers.

- Perform a functional check.

Replacement of the single tank

Required equipment: Tightening belt or rope

NOTE

When replacing the single tank, the filament current (I_H) must be set prior to the first exposure (see "D916 settings" and "Filament current" in these instructions).

- Switch off the system and possibly disconnect the power plug.
- Remove the upper covers and, in the case of the MOBILETT XP Digital, place them on their sides on a table or similar surface. Do not disconnect any cables from the MOBILETT XP Digital.
- Move switch SW2B on D916 to 2 (service program) and switch the system on.
- Read out the exposure counter and make a note of the data. To do this, use service program 2 (refer to Troubleshooting Instructions SPR8-230.840.01...).
- Switch off the system and possibly disconnect the power plug.
- Remove the cover to access the counterweight setting.
- Secure the support arm with a tightening belt or rope (B/Fig. 53 / p. 64). Ensure that the single tank can be safely removed.
- Mark the position of the stop unit (C/Fig. 53 / p. 64) and remove it.
- Neutralize the spring tension of the counterweight by loosening the adjusting screw (Fig. 54 / p. 64).

  Do not completely remove the screw. Turn it counterclockwise only until the spring releases the tension on the support arm.
- Disconnect the plug of the DAP measurement chamber (if present).
- Remove the tube and collimator covers.
- Disconnect all cables between collimator and single tank.
- Remove the collimator, see the "Replacing the collimator" section in these instructions.
- Remove all the cables on the single tank (Fig. 56 / p. 65).
- Remove the four screws (Fig. 55 / p. 65) of the single tank attachment.
- **Remove the single tank. Do not twist the fork**.

  The new single tank must be installed in the same position.
- Attach the tube to the fork via the four screws (use Loctite 242).
- Initially set the counterweight of the support arm via the adjusting screw (Fig. 54 / p. 64) so that the single tank is balanced.
- Screw on the stop unit of the swivel joint of the fork as previously marked (C/Fig. 53 / p. 64).
- Attach the bracket of the cover of the defective single tank to the new single tank (Fig. 56 / p. 65).
- Reconnect all cables to the single tank (Fig. 56 / p. 65).

- Install the collimator and connect the cables to the single tank. (See the "Replacing the collimator" section of these instructions)
- Connect the plug of the DAP measurement chamber (if present).
- Set filament current (I_H) according the "D916 settings" and "Filament current" sections (in these instructions).
- Check the "light field - radiation field" deviation and adjust it if necessary. (See the "Collimator" and "Light field - radiation field" sections of these instructions).

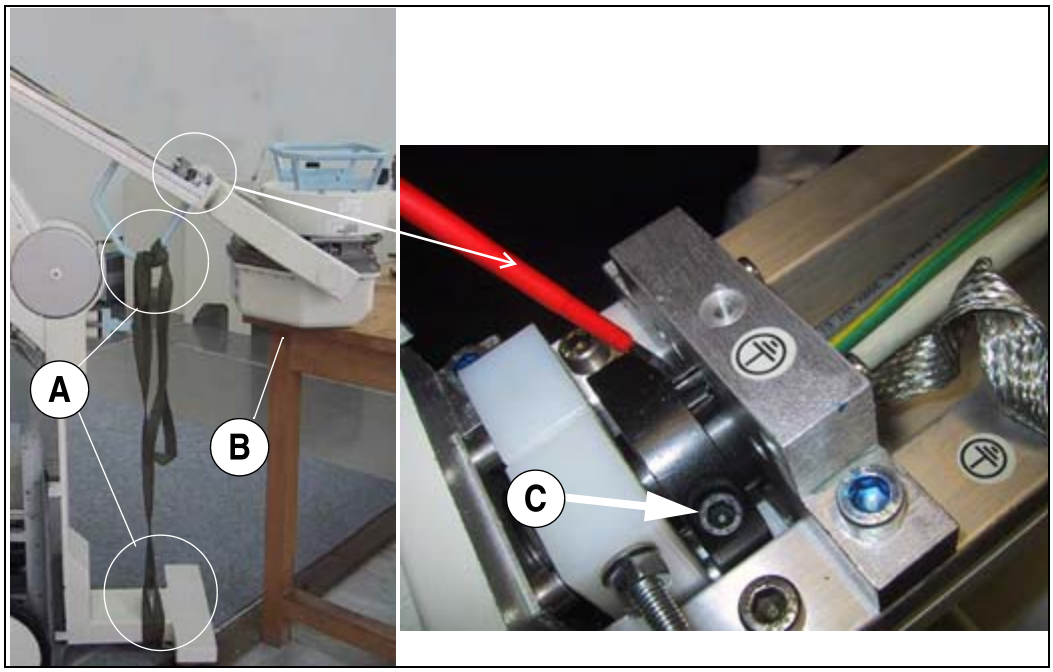

Fig. 53: Fastening the support arm

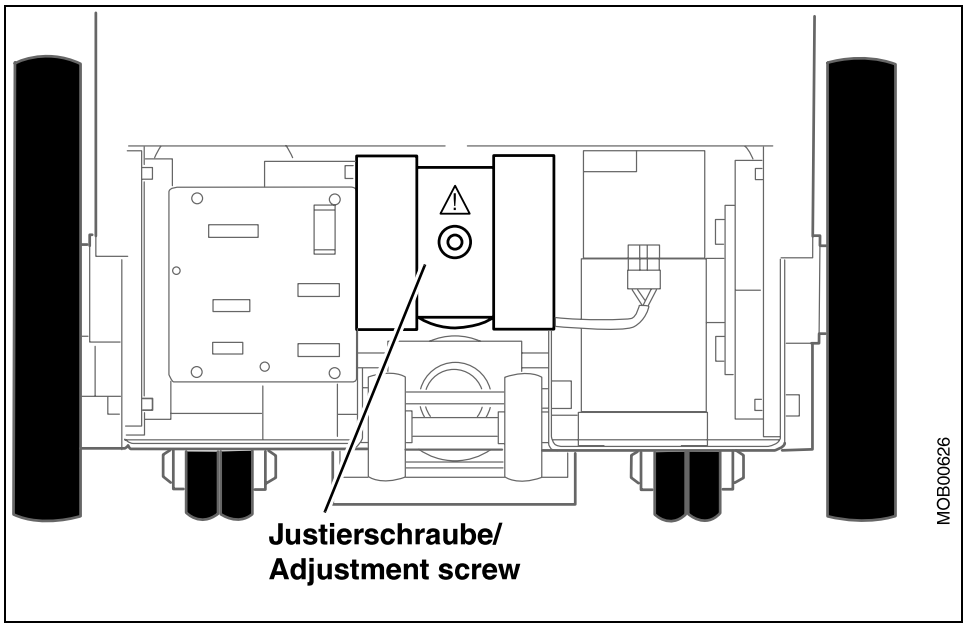

Fig. 54: Adjusting the counterweight

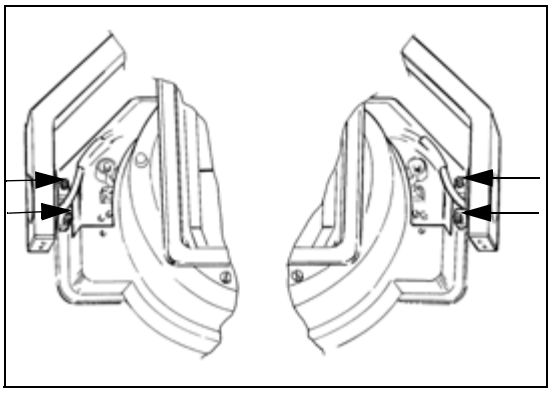

Fig. 55: Dismantling the single tank

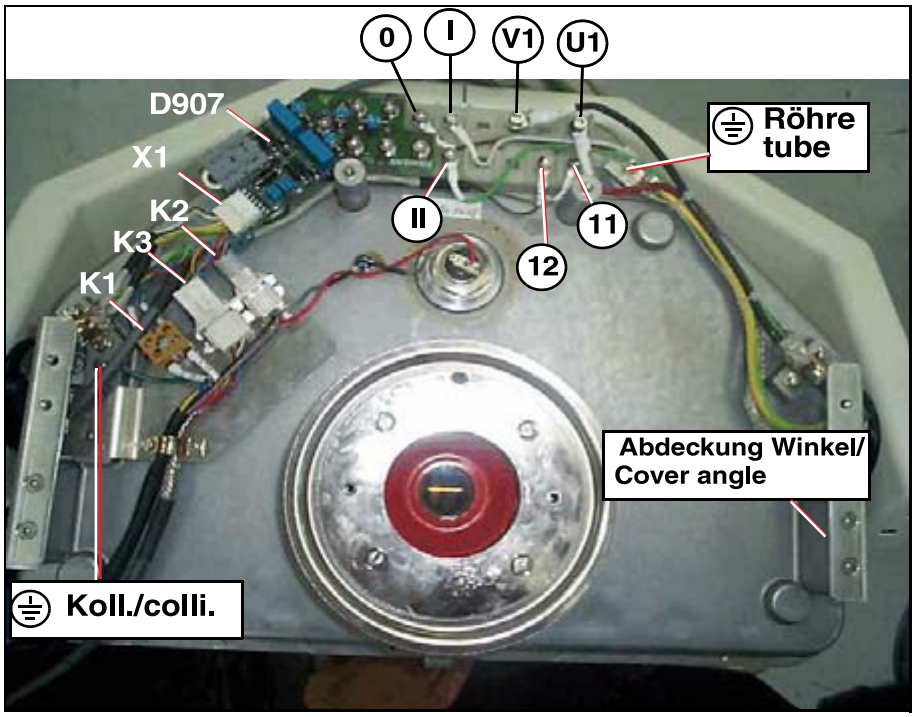

Fig. 56: Single tank connection

- Refit all covers on the single tank and perform a complete functional test.
- Set the counterweight of the support arm via the adjusting screw (Fig. 54 / p. 64) so that the single tank is always balanced.
- File the documents included with the tube in the technical file in the “Certificates“section. Note the value of the exposure counter (service program 2) as the startup value of the new tube.

Replacing the support arm cable harness

Required equipment: Tightening belt or rope

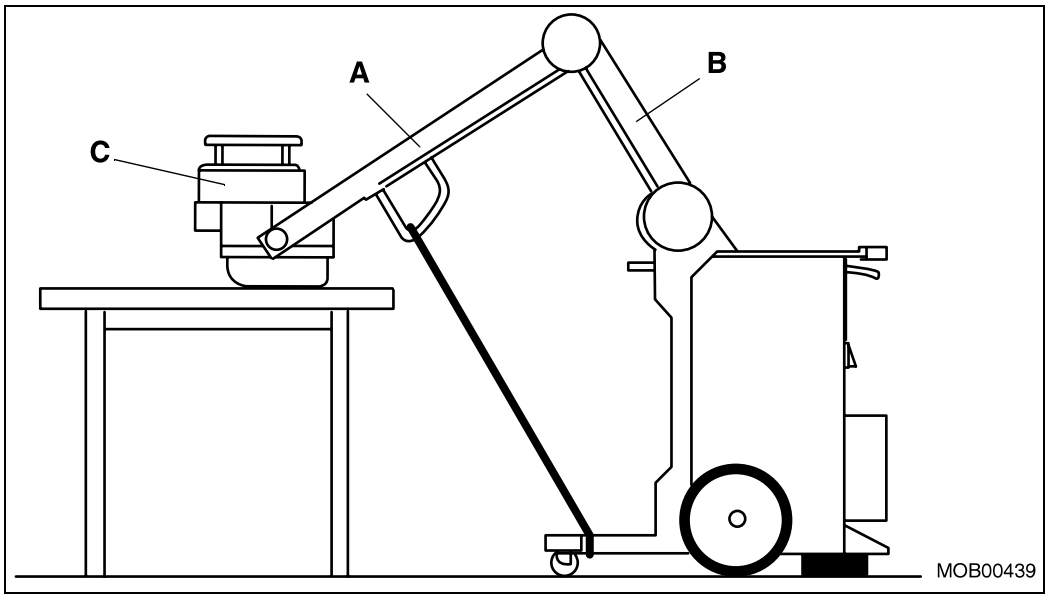

Fig. 57: Replacing the tank

- Switch off the system and possibly disconnect the power plug.
- Place the system so that the single tank rests on a table. Secure the support arm with a rope (Fig. 57 / p. 66).
- Remove all single tank and collimator covers (A, B, C).

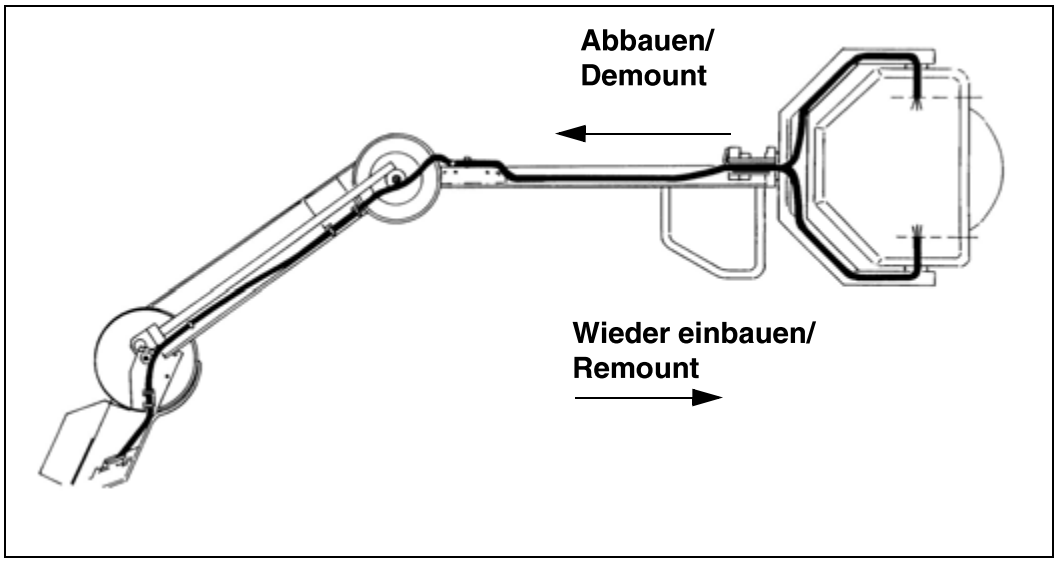

Fig. 58: Replacing the cables

- Remove the back cover (access to the counterweight setting).

- Neutralize the spring tension of the counterweight by loosening the adjusting screw (Fig. 54 / p. 64).
  - ➪ Do not completely remove the screw. Turn it counterclockwise only until the spring releases the tension on the support arm.
- Disconnect all cables running to the collimator.
- Remove the collimator, see the "Replacing the collimator" section in these instructions.
- Disconnect all electrical connections to the single tank.
- Measure and note the outlet lengths of the cables (fork outlet up to connection on the single tank).
- Remove all cable clamps and cable ties from the arm and chassis.
- Separate the single tank and fork from the arm.
- Take the fork apart so that the cables can be removed.
- Separate the chassis connections and remove the cables (Fig. 58 / p. 66).

Reinstall the support arm cable harness. Perform the above steps in the reverse order.

- Connect all cables to the single tank (see (Fig. 56 / p. 65)).
- Install and cable the collimator. Only attach the collimator cover (C/Fig. 57 / p. 66).
- Make all connections and refit all cable clamps.

NOTE	**Do not tighten the cable in the arm.** **There must be sufficient slack so that no tension is exerted on the cable during any movements.**

- The attachment means between the fork and the arm must be securely tightened via Loctite 242.
- Attach the covers (A/ B/Fig. 57 / p. 66).
- Remove the rope between handle and the base; the single tank continues to rest on the table.
- Tighten the adjusting screw of the counterweight until the single tank and arm are balanced. See the "Adjustments of the articulated arm system" section.
- Check the light field and radiation field and adjust them if necessary. (See the "Collimator" and "Light field-radiation field" sections).
- Perform a functional test.
- Install the cover panels.

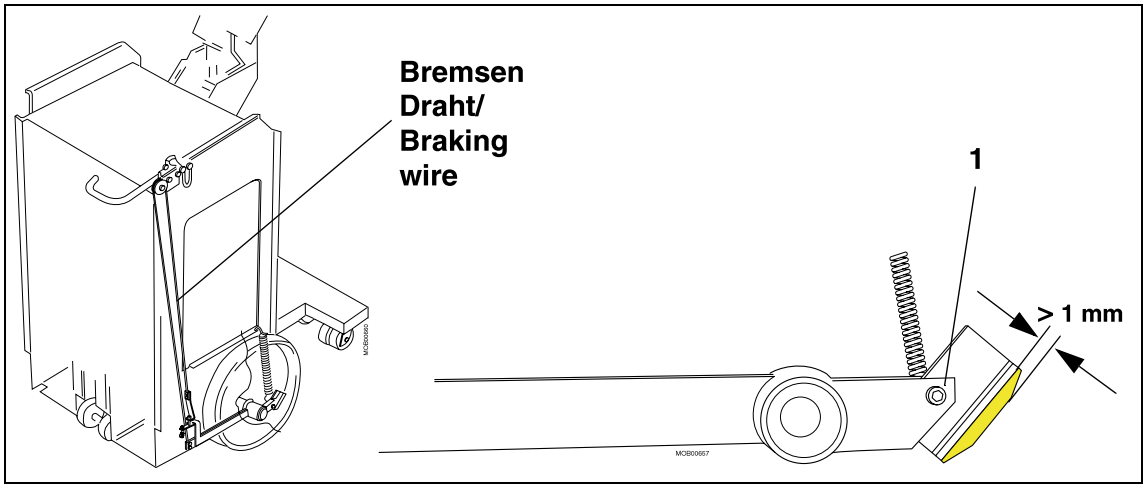

Fig. 59: Wheel brake

System brakes

Required equipment: Spring balance for 350 Nm, 2 wooden blocks (approx. 50x70x500mm)

Inspection and replacement

- Disconnect the system from the power outlet.
- Jack the system up on both sides on approx. 5 x 7 cm wooden blocks. It must be possible to turn the wheels freely.
- Remove the rear wheels.
- Check the brake linings. If the brake linings are thinner than 1 mm, they must be replaced (Fig. 59 / p. 68).
- Loosen the screw to remove the old lining (Fig. 59 / p. 68) .
- Pay attention to the alignment of the brake surface with installing the new lining.
- Reinstall the wheels.
- Apply the brake. You should not be able to move the system by applying normal manual force. If more force is applied (i.e. more than 350 N) slight movement is permissible.

Brake force adjustment

- Adjust the screw (Pos. 1/Fig. 60 / p. 69) so that the brake arm moves back just far enough to release the brake (there should be no grinding noise when the system moves). Secure this position with the lock nut.
- Tighten the adjusting screw while the brake is released (Pos. 2/Fig. 61 / p. 70) until the necessary braking force is achieved.

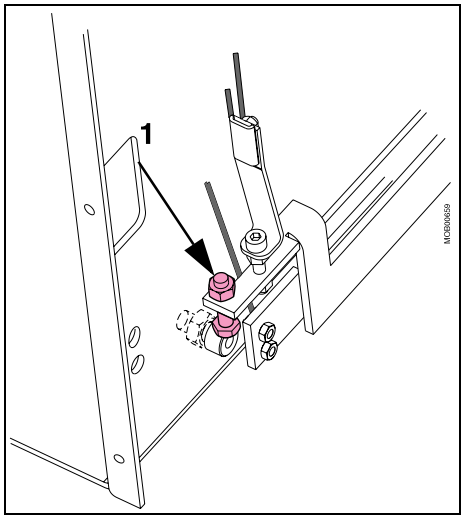

Fig. 60: Wheel brake 1

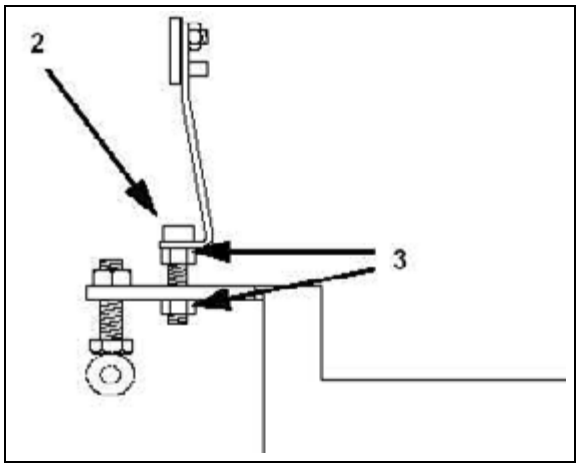

Fig. 61: Wheel brake 2

- When the adjustment is complete, the connection piece to the cable is positioned as shown in (Pos. 3/Fig. 61 / p. 70). Fix this position using the lock nut.

Castors

Required equipment: 1 wooden block (approx. 50 x 70 x 500 mm)

- Jack the system up with the wooden block.
- Block the rear wheels so that they can no longer turn.
- Remove the snap rings (Pos. 1/Fig. 62 / p. 71).
- Remove the axle and the support rollers.
- Install new support rollers.
- Check the rollers for smooth rotation.
- Remove the wooden block.

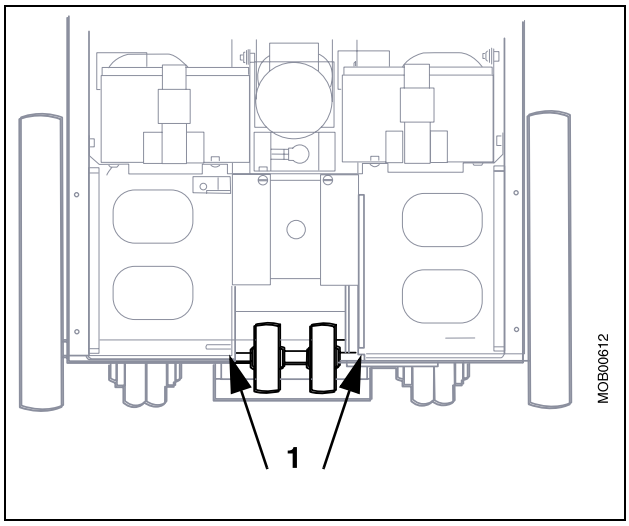

Fig. 62: Castor

Friction linings

Replacing the horizontal friction lining

- Remove the joint covers.
- Remove the locking nut.
- Remove the screw and spring washers.
- Replace the horizontal friction lining.
- Reattach the screw and spring washers (Fig. 63 / p. 72). Secure screw with the locking nut.
- Adjust the horizontal friction lining; see the following section: "Adjustment of the friction linings".
- Replace or install all covers.

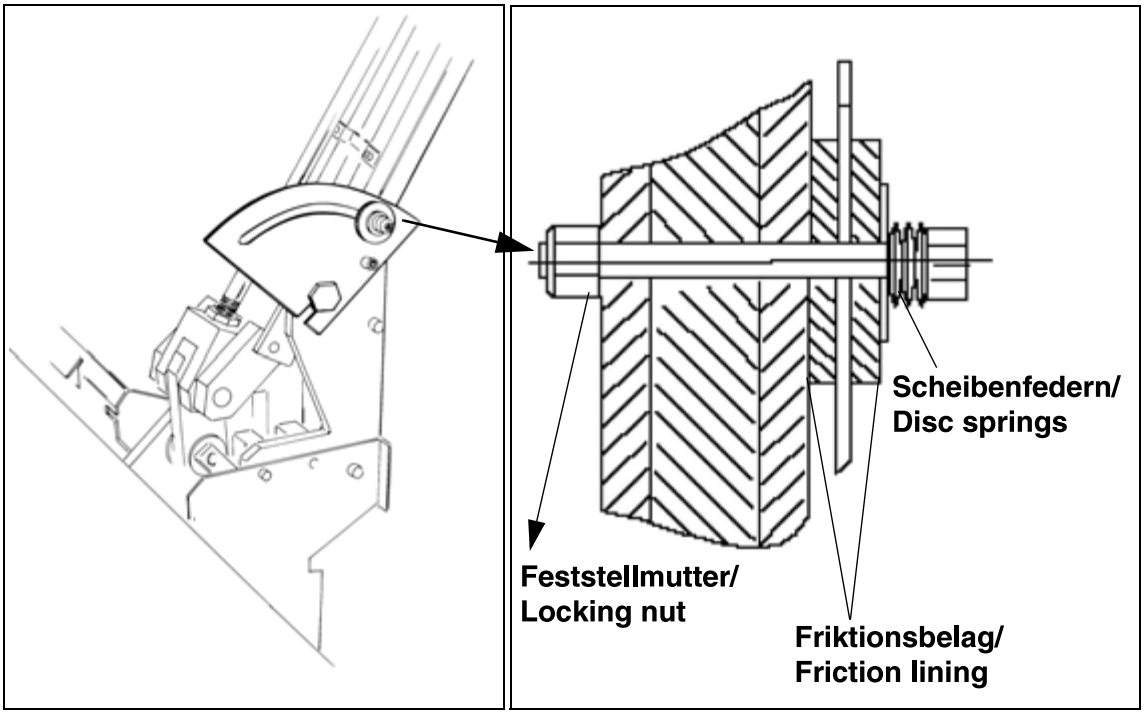

Fig. 63: lo_arm_stability_1

Replacement of the vertical friction linings

Required equipment: 1 wooden block (approx. 50x70x500 mm)

- Lift the single tank to maximum height and secure it with the rope to the ceiling beam (Fig. 64 / p. 73).

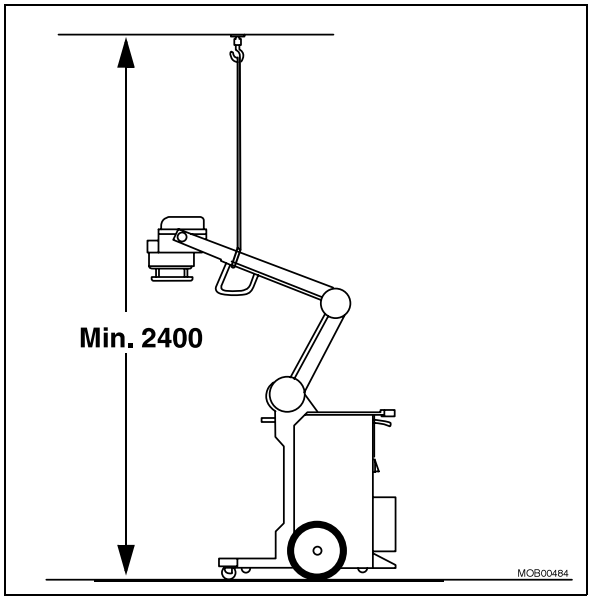

Fig. 64: Releasing the arm

NOTE

The ceiling beam must be designed to bear a 100 kg load. The support arm with the single tank may not sink down during the procedure.

⚠WARNING

Risk of injury!

Do not stand under the single tank or the support arm while performing the following work!

➪ Disregarding this could result in death or injury!

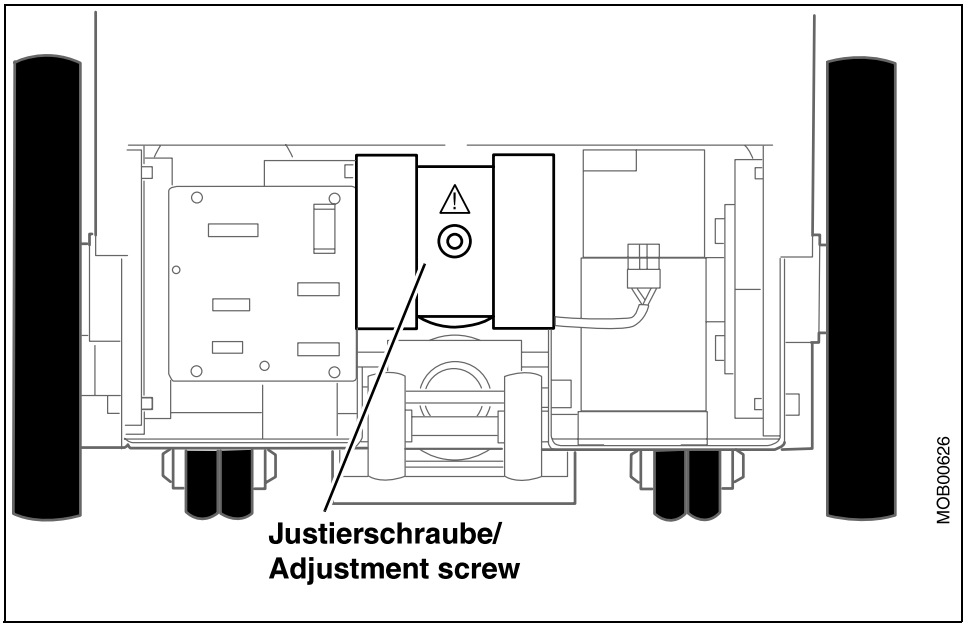

Fig. 65: Adjusting the counterweight

- Loosen the adjusting screw until the arm is no longer held by the spring offset (Fig. 65 / p. 73). Do not unscrew the adjusting screw any further or the spring assembly will fall.

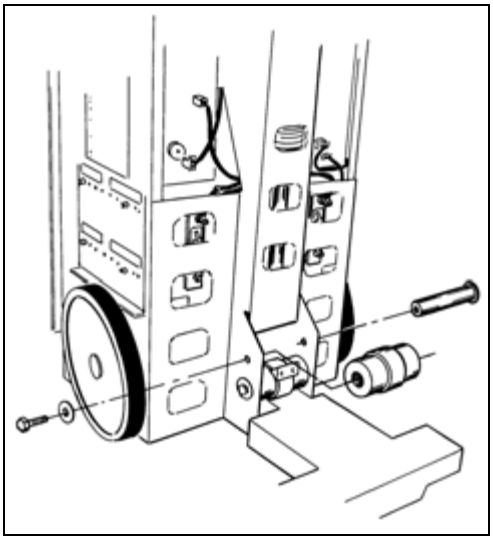

Fig. 66: Vertical friction

- Remove the screw and washer from the upper counter bearing (Fig. 66 / p. 74).
- Remove the friction linings.

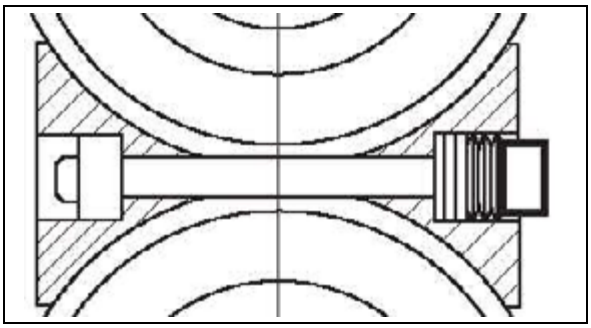

Fig. 67: Friction lining

- Install the new friction linings (Fig. 67 / p. 74).
- Reinstall the upper counter bearing.
- Tighten the screws.
- The counter bearing should not be affected by the brake.
- Tighten the adjusting screw until the support arm with the single tank is only held in the top position by spring force.
- Remove the ceiling suspension.
- Check the parallelism ("Parallelism" section).
- Reinstall all covers on the support arm.
- Adjust the counterweight ("Counterweight" section).
- Adjust the friction linings (section “Adjustment of the friction linings”)
- Reinstall all covers.

Power cord or cable winch

- Switch off the system and disconnect the power plug.
- Remove the upper cover panel and, in the case of the MOBILETT XP Digital, place it on its side on a table or similar surface.
- Remove the rear cover panel and the side cover panels.
- Remove the metal plate over board D916. For MOBILETT XP Digital, first remove the CXDI PC (laptop), and remove the holder plate as well.
- Unplug the plugs X2, X10, X11, and X20 on the D916 board and pull them out through the cutouts in the chassis.
- For MOBILETT XP Digital, unplug the cables for the PC switch and the external LAN connection, and unscrew the external USP connection (see (Fig. 68 / p. 75)).

Fig. 68: Remove cable

- For MOBILETT XP Digital, swing out the "Powerbox/U3" assembly.
- Remove the safety cover in front of the D927 board.

⚠ DANGER

440 V_{DC} at fuse F5 on D927 board!

There is a risk of life-threatening electrical shock.

➪ **Wait 15 minutes and measure the electrical voltage at F5, at the metal frame. The voltage should then be < 40 V_{DC}.**

- Unplug X14 plug on D927 board (cable from line voltage filter).
- For MOBILETT XP Digital, unscrew the holding plate with the key switch (3 screws, see (A/Fig. 69 / p. 76)). If necessary, remove the stay bolt (see (B/Fig. 69 / p. 76)).

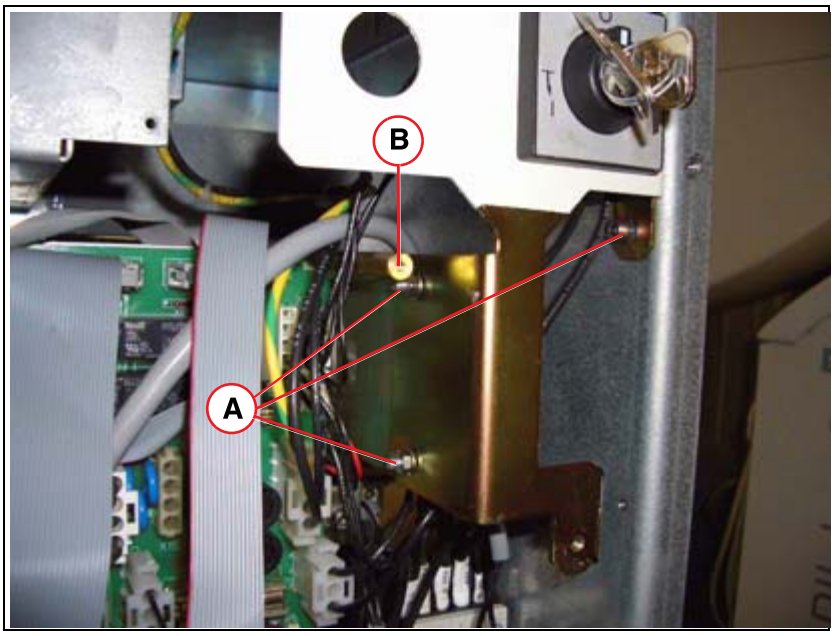

Fig. 69: Holding plate

- Remove the 4 attachment screws of the cable winch housing (2 per side) (see (1/Fig. 70 / p. 76)).

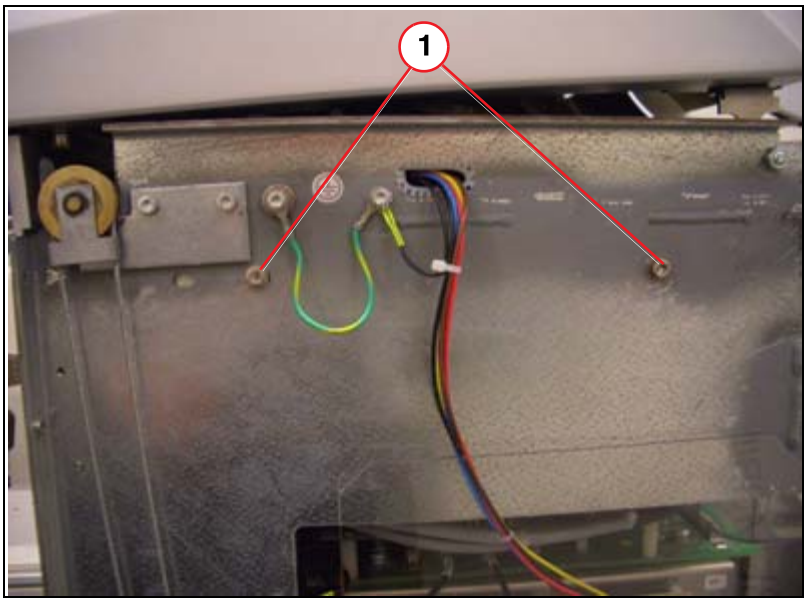

Fig. 70: Mounting screws

- Pull out the cable winch housing.
- Remove the Allen screws on the top side of the housing (see (Fig. 71 / p. 77)).

NOTE	**The screws are secured with Loctite.**

Fig. 71: Upper side cable winch housing

- Remove the cover of the housing.
- Remove the spacer ring and the upper plate (with the cables) from the axle of the cable winch (see (A / B/Fig. 72 / p. 77)).

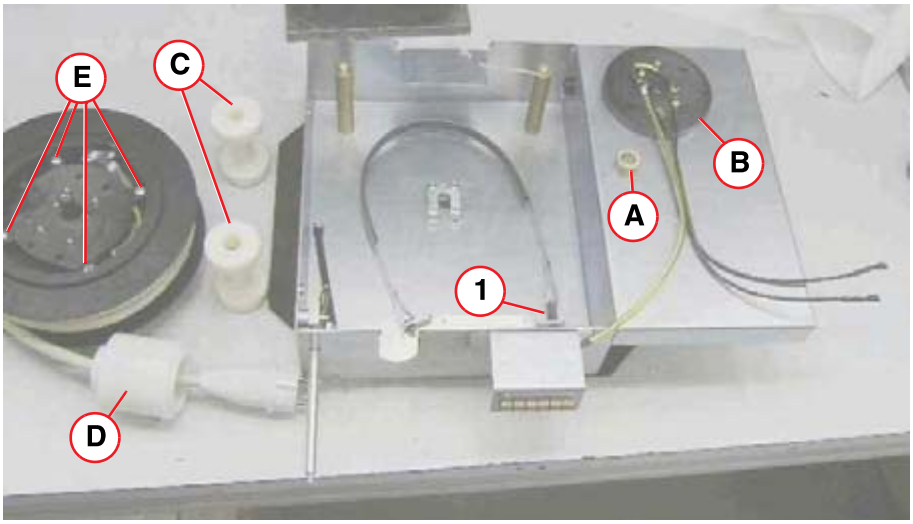

Fig. 72: Cable winch removed

- Remove the two white plastic rollers (see (C/Fig. 72 / p. 77)).
- Take the white plastic ring (see (D/Fig. 72 / p. 77)) out of the guide and carefully release the brake to release the spring tension.
- Remove the Allen screw on the underside of the housing.

NOTE	**The screw is secured with Loctite.**

- Remove the cable winch.

- Clean the cable winch housing.
- Remove the power plug, cable stop, and white plastic ring from the power cable.

If the entire cable winch must be replaced:

- Continue with **"B"**.

If only the power cable needs to be replaced:

- Remove the four screws (see (E/Fig. 72 / p. 77)).
- Remove the connector plate and disconnect the power cable (see (Fig. 73 / p. 78)).

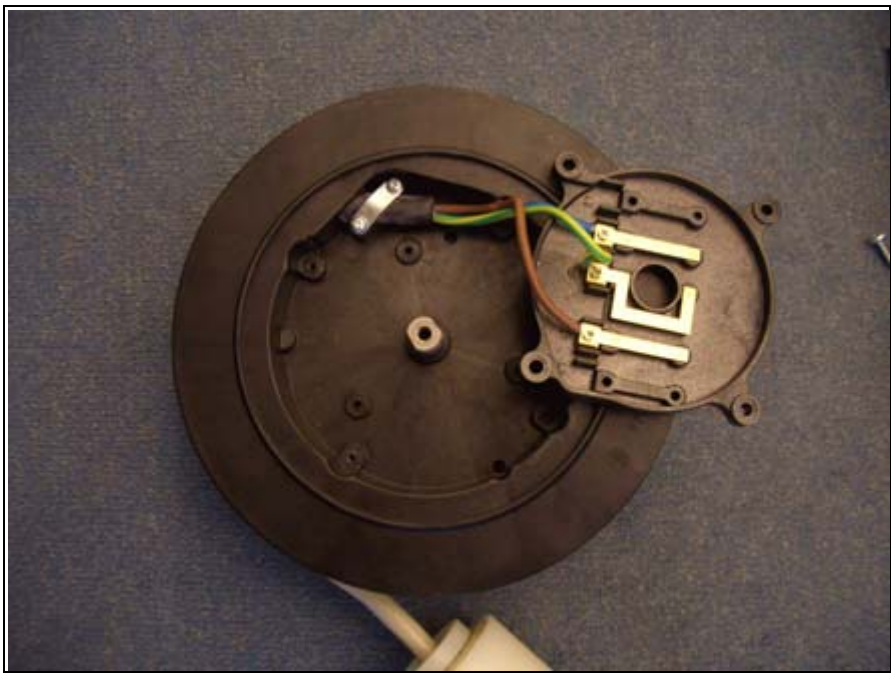

Fig. 73: Connector plate

- Install the new power cable on the cable winch and connect it to the connector plate.

NOTE	**Wrap the power cable around the cable winch securely (no play).**

- Screw down the connector plate with the four screws.

"B"

- Install the plastic ring, cable stop, and power plug.
- Reinstall the cable winch.

NOTE	**Make sure the cable winch axle is flush with the cover (see (Fig. 74 / p. 79)).**

Fig. 74: Cable winch axle

- Screw the underside lock screw back in and tighten it.

NOTE	**Use Loctite 242.**

- To tighten the spring, pull the cable out all the way and wind it back on to the cable winch by hand. (Do not release the brake while doing so!)

  Repeat as many times as necessary until the spring is completely tightened.

  Then completely unwind the cable by hand, place the plastic ring in the guide, and roll the cable up all the way by carefully applying the brake.
- Install the two white plastic rollers (see (C/Fig. 72 / p. 77)).
- Install the upper connector plate and the spacer ring (see (A / B/Fig. 72 / p. 77)).
- Reinstall the cover.

NOTE	**Use Loctite 242.**

- Tighten the lock screw on the underside again.
- Pull the cable out all the way.
- Check the function of the cable winch and brake.

NOTE

The cable winch should not wind on its own. Use the screw (see (1/Fig. 72 / p. 77)) to adjust the braking force.

- **Clockwise -> increases brake force.**
- **Counterclockwise --> decreases brake force.**

- Reinstall the entire assembly. For assembly follow the directions above in reverse order.
- Perform a function test of the unit.

Transmission belt (Hybrid/Digital)

Required equipment: 1 wooden block (approx. 50x70x500 mm)

NOTE

Under normal circumstances, the belt drive should not have to be readjusted during the entire life of the unit.

Replacement of the belt

- Remove the side covers.
- Tilt the unit and prop up the affected side with a piece of wood.
- Secure the other wheel with two wedges to keep it from turning. Do not use the parking brake.
- Remove the wheel as illustrated in (Fig. 75 / p. 81).
- Loosen the two screws (A/Fig. 76 / p. 82).
- Loosen the tension bearings with a 13mm wrench (B/Fig. 76 / p. 82).
- Remove the belts.
- Insert the new belts.
- Tighten the tension bearings (B/Fig. 76 / p. 82) and the screws (A/Fig. 76 / p. 82).
- Manually turn the large toothed gear and verify smooth movement. The belt must be seated correctly on the gears.
- Adjust the tension as described in "Adjusting the belt tension".

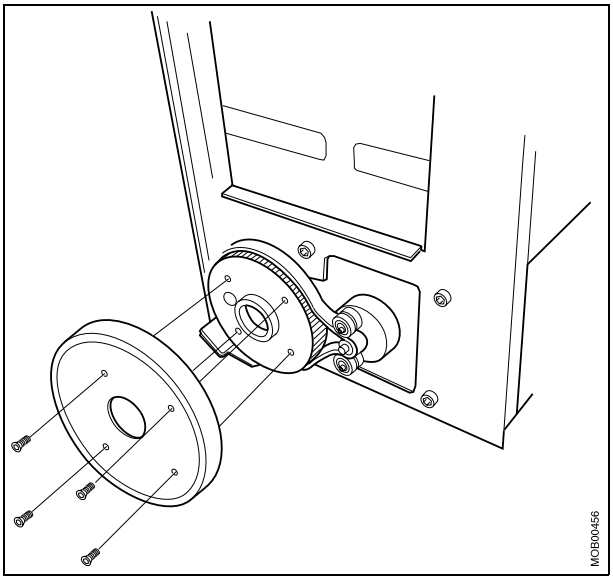

Fig. 75: Wheel disassembly

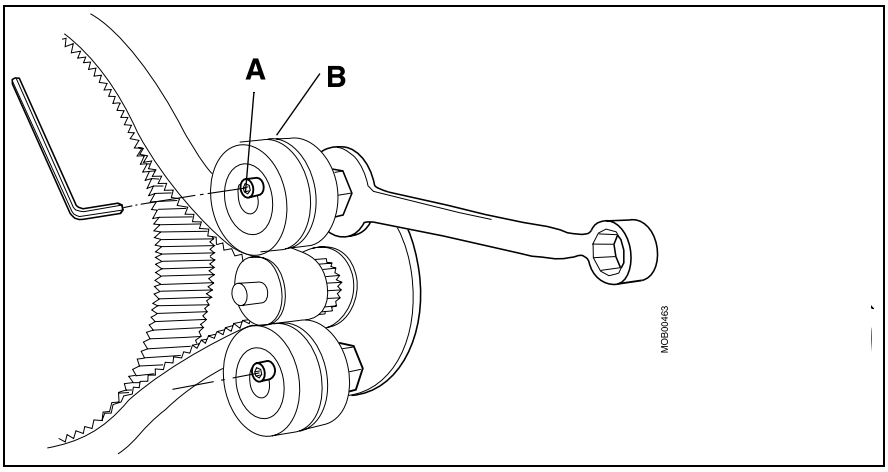

Fig. 76: Drive belt

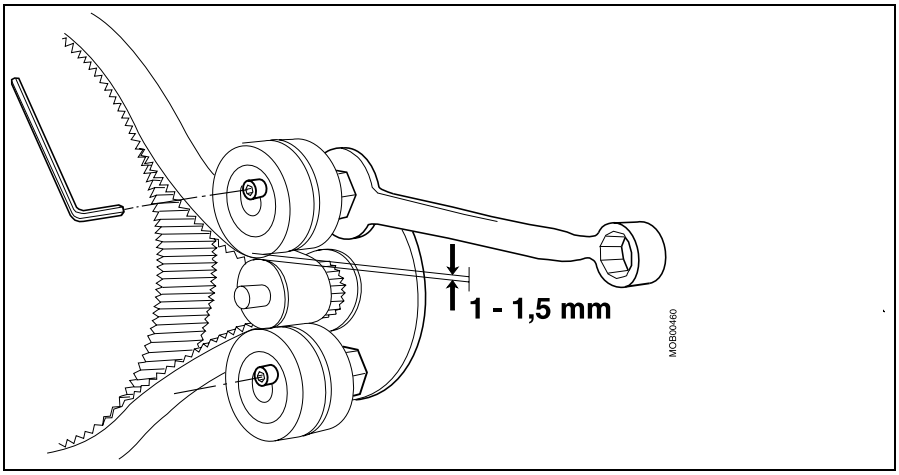

Fig. 77: Belt tension

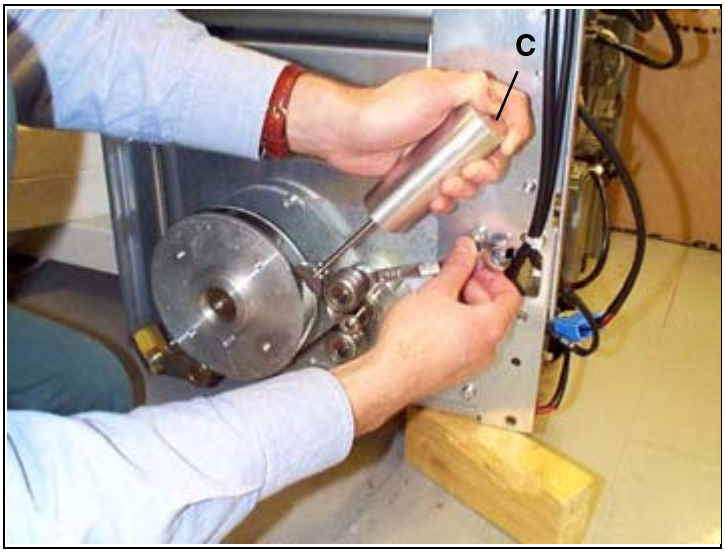

Fig. 78: Belt_adjustment_new

Adjusting the belt tension

- Loosen the screws (A/Fig. 76 / p. 82). Now the transmission belt tension can be adjusted using a 13 mm wrench.
- Press the special adjustment mechanism on the transmission belt and hold one finger on the top. When the button (C/Fig. 78 / p. 82) is the same height as the upper part of the adjustment mechanism, the pressure is adequate.

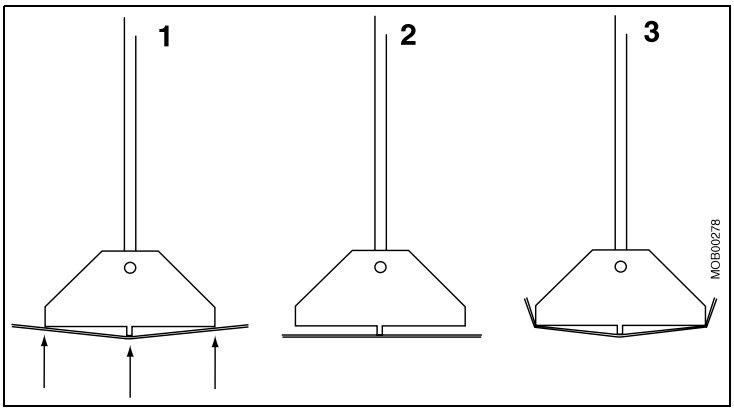

Fig. 79: Measure belt tension

- Using the wrench, adjust the transmission belt tension equally on both tension bearings to a minimum distance of 1-1.5 mm between the bearing and the washer (Fig. 77 / p. 82). The tension of the transmission belt is correct when the adjustment mechanism and the belt touch at exactly three points (1/Fig. 79 / p. 83). In (2/Fig. 79 / p. 83) the belt is too taut and in (3/Fig. 79 / p. 83) too loose.
- Tighten the screws (A/Fig. 76 / p. 82).
- Reattach the wheel.
- Reinstall the cover panels.

Replacing the motor unit (Hybrid/Digital)

Required equipment: 1 wooden block (approx. 50x70x500 mm)

- Remove the back and side covers.
- If the left motor has to be replaced:
  - ➪ Remove motor power pack (D102).
- If the right motor has to be replaced:
  - ➪ Remove power supply U4 in the XP Digital.
- Tilt the unit and prop up the affected side with a block of wood.

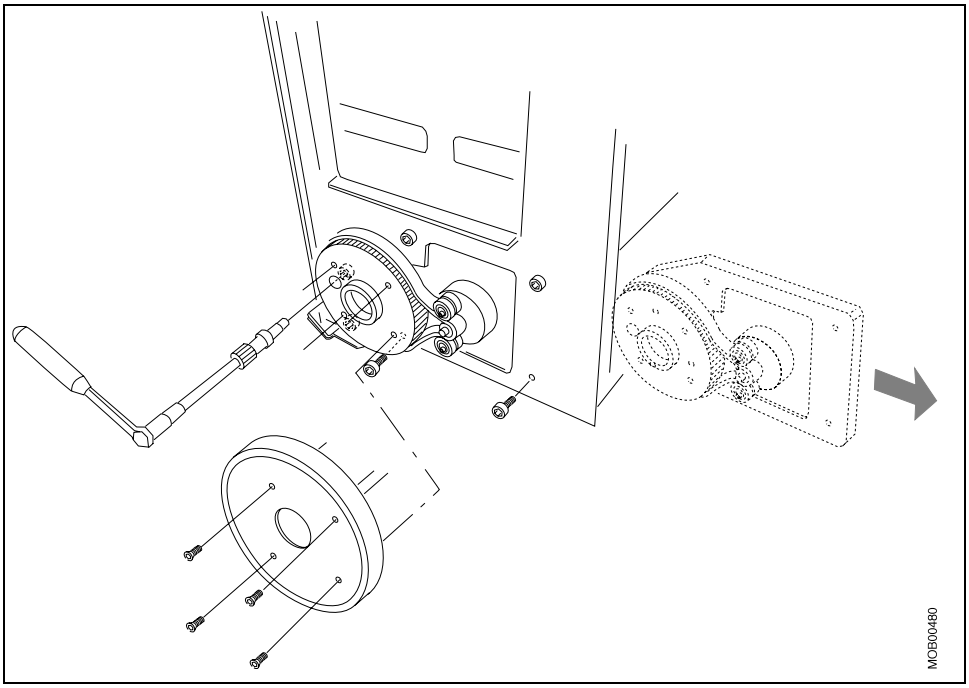

Fig. 80: Remove wheel and motor

- Secure the other wheel with two wedges to keep it from turning.
  - ➪ **Do not use the parking brake**.
- Remove the wheel and the four screws as shown in (Fig. 80 / p. 84).
- Remove the six screws that hold the motor. Two of the screws can be accessed through a hole in the toothed gear.
- Remove the entire motor unit - towards the inside through the opening in the chassis.
- Install the new motor using the six screws.
- Possibly reinstall motor output pack (D102) or power supply U4.
- Install the wheel using the four screws.
- Remove the wooden block.
- Reinstall the cover panels.

Calibrating the DAP system (option)

Recalibration procedure

Required equipment: Dosimeter, calibration tool item number 65 84 978

- System OFF.
- Unplug the plug of the DAP ionization chamber (1/Fig. 81 / p. 85).

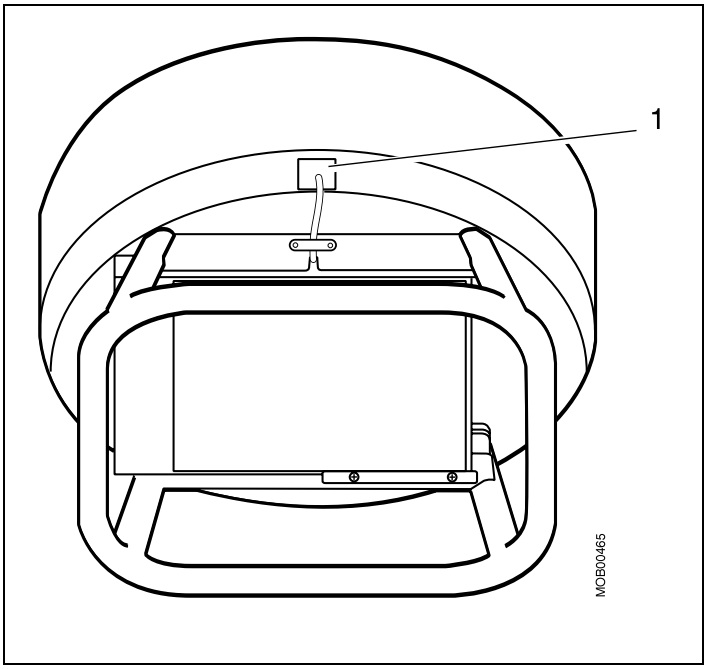

Fig. 81: DAP plug

- Connect the DAP calibration tool between the plug and the box.
- System ON.
- Perform the calibration setup (Fig. 82 / p. 86).

NOTICE

Measurement error!

➪ **The temperature/pressure factor of the dosimeter must be taken into account when using a semiconductor detector (see manufacturer data).**

➪ **Otherwise, there may be a deviation from the factory calibration.**

- Switch on the light localizer. Place the dosimeter in the center of the light field and in open air (to prevent radiation backscatter).

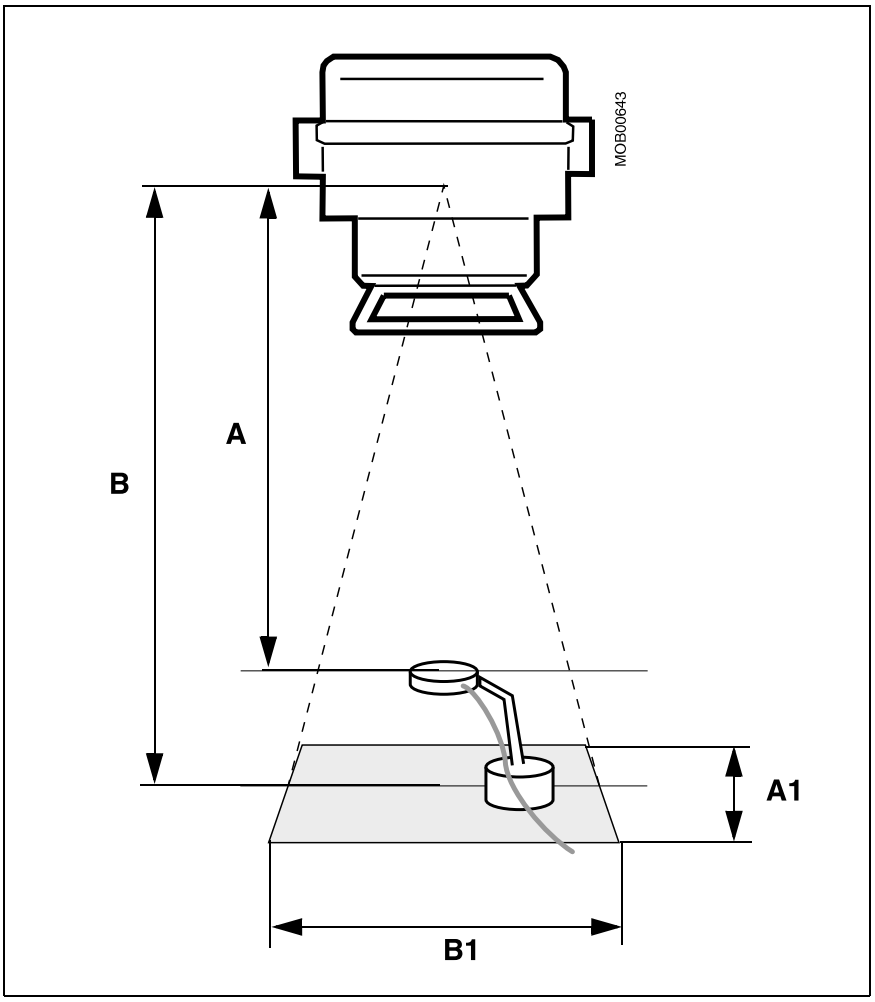

Fig. 82: DAP calibration setup

- Measure the focus-to-dosimeter distance (A/Fig. 82 / p. 86) and then the **width** and **length** of the light field on the surface. For optimal precision, position an unexposed film cassette on the surface and measure the width and length of the exposed surface after releasing an exposure.
- Measure the focus-to-light field/surface (B/Fig. 82 / p. 86).
- Use the following formula to calculate the reference surface F_{REF}.

$$F_{REF} = \frac{A^2}{B^2} x (B1 x A1) \quad (\text{unit } m^2)$$

Fig. 83:

- Adjust the kV to 102 and mAs to 20 and release an exposure.
- Record the dose value measured with the dosimeter.
- Calculate the DAP reference value using the following formula and the measured dose value:

Reference DAP value = measured dose value x reference surface (unit µGy m^2)

- Make a note of the DAP value displayed on the DAP measurement system.
- Calculate a reference value using the following formula:

Reference value (%) = ((100 · DAP value on the display): Calculated DAP value) - 100

The reference value shows the deviation between the actual DAP value (measured using the dosimeter) and the DAP value measured by the DAP measurement system. If the reference value is negative, the DAP value displayed is lower than the actual value. If the reference value is positive, the opposite is true. If the reference value is below ± 5%, the calibration is complete.

- To correct the deviation on the calibration tool, press the "UP" button (for a negative reference value) or the "DOWN" button (for a positive reference value). Pressing the button one time affects a change in the reference value by approx. 0.5%.

NOTE

The middle button on the DAP calibration tool is for test purposes. It has the same function as the test button on the DAP display.

- Repeat the calibration procedure until the deviation is less than 5%.
- System OFF.
- Remove the DAP calibration tool and reconnect the DAP ionization chamber (1/Fig. 81 / p. 85).
- System ON.
- Press the Reset and Test buttons on the DAP display to complete the calibration procedure.

- Release an exposure.

NOTE

No technical modifications should be made to the DAP ionization chamber or the display.

Replacing the collimator lamp

Required equipment:	Tightening belt or rope (4 m), set of Allen wrenches, set of screwdrivers, 24 V/100 W lamp, order no.: 083 92 016

Work steps:

- Switch off the system and possibly disconnect the power plug. (In the case of Hybrid, operating mode switch = 0)
- Use a rope or tightening belt to secure the system support arm against lifting (A/Fig. 84 / p. 88).

  ➪ The single tank should rest securely on a table or the like.

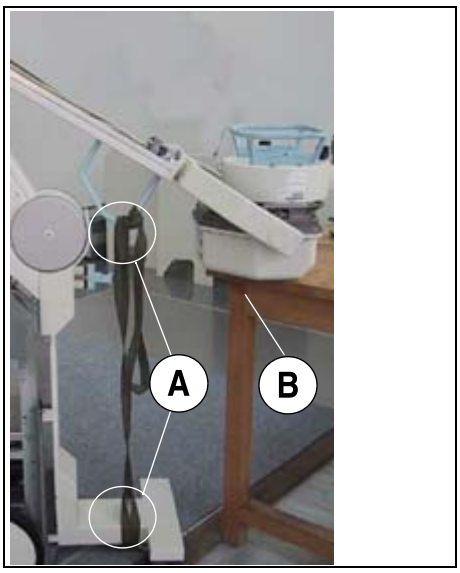

Fig. 84: Single-tank service position

- Remove the two adjustment knobs of the collimator (2 mm Allen wrench) (C/Fig. 85 / p. 89).

  ➪ Note the position of the knobs during removal!

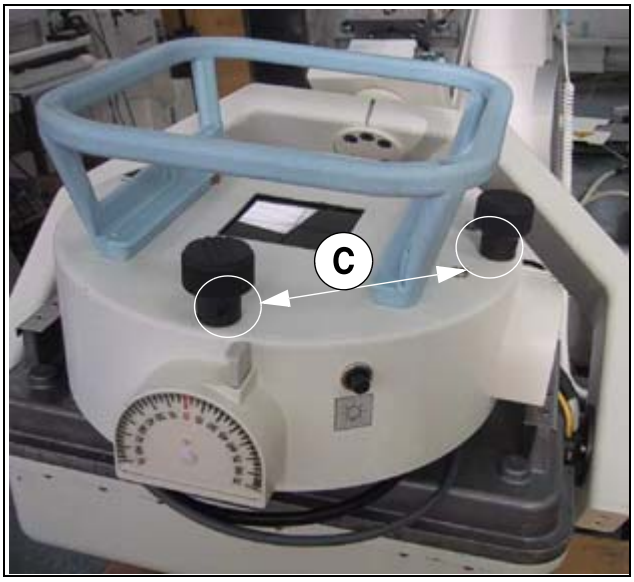

Fig. 85: Collimator knobs

- Disconnect the plug of the DAP measurement chamber (if present).

- Open the collimator cover (1/Fig. 86 / p. 90).
  - ➪ Turn the cover over, place it next to the single tank, and remove the connections: DAP plug; light switch, ground wire (Fig. 87 / p. 90).

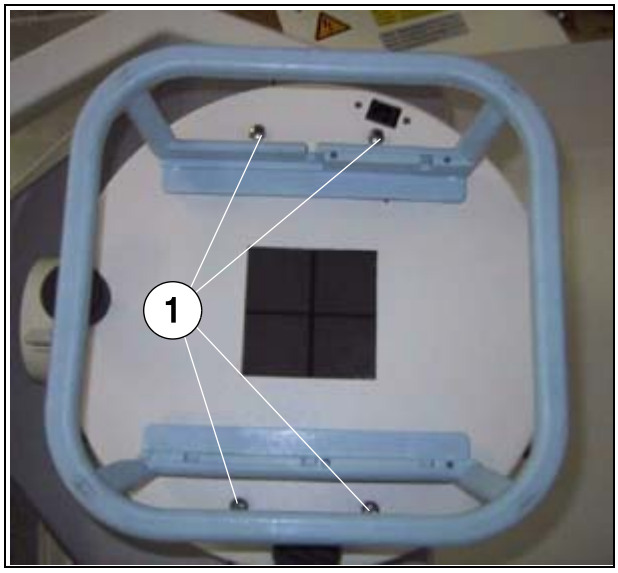

Fig. 86: Collimator cover

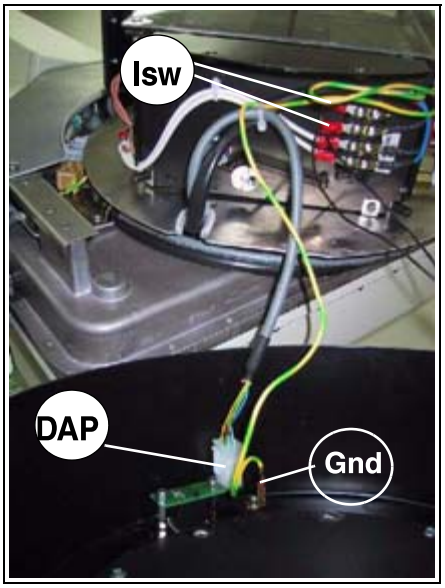

Fig. 87: Plug of cover

- Remove the protective cover from the lamp (4/Fig. 88 / p. 91).

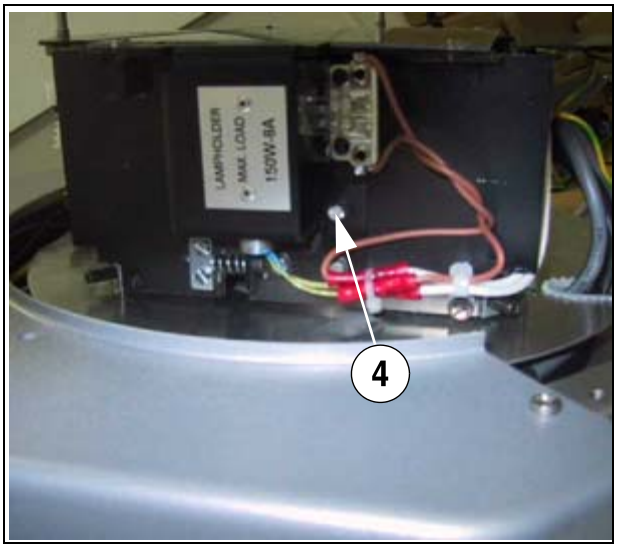

Fig. 88: Lamp shield

NOTE

Under no circumstances may you touch the new lamp with your bare fingers. Use a dry, clean cloth for this purpose.

- Replacing the lamp
  - ➪ The light coil of the lamp must be positioned over the rectangular light aperture (6/Fig. 89 / p. 91).

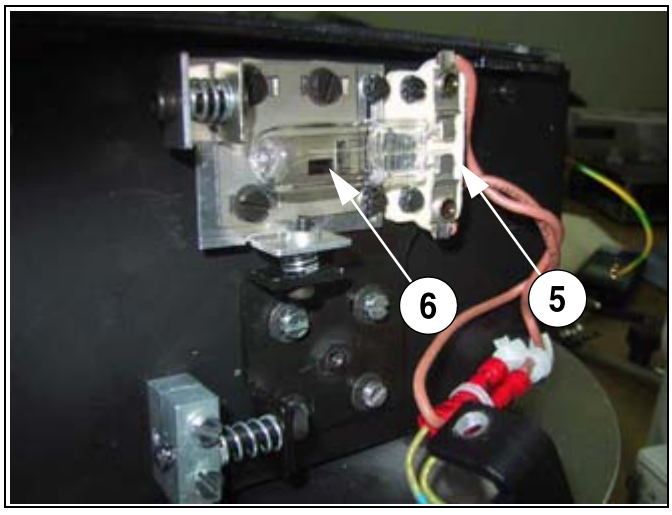

Fig. 89: Lamp socket

- To reassemble, repeat the above steps in reverse order.
- Connect the system to the power supply and test the light function via the three buttons for the collimator light.

Replacing the collimator

Required equipment: Tightening belt or rope (4 m)

- Switch off the system and possibly disconnect the power plug. (In the case of Hybrid, operating mode switch = 0)
- Use a rope or tightening belt to secure the system support arm against lifting . The single tank should rest securely on a table or the like (A/Fig. 84 / p. 88).
- Remove the two adjustment knobs of the collimator (2 mm Allen wrench) (C/Fig. 85 / p. 89).
  - ➪ Note the position of the knobs during removal!
- Disconnect the plug of the DAP measurement chamber (if present).
- Open the collimator cover (1/Fig. 86 / p. 90).
  - ➪ Turn the cover over, place it next to the single tank, and remove the connections: DAP plug, light switch, ground wire (Fig. 87 / p. 90).
- Remove the single tank cover.

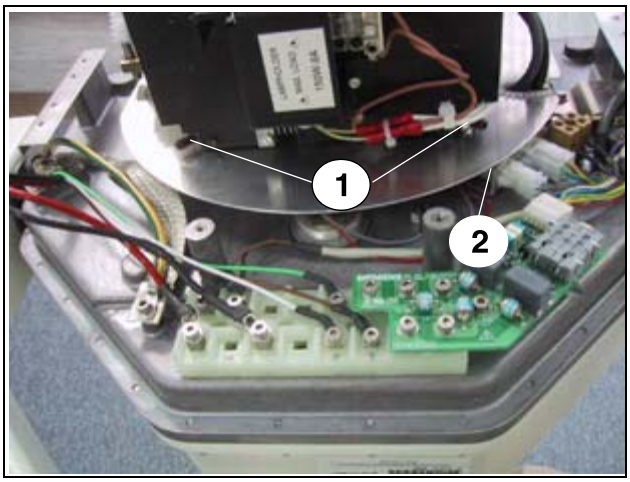

Fig. 90: Collimator attachment

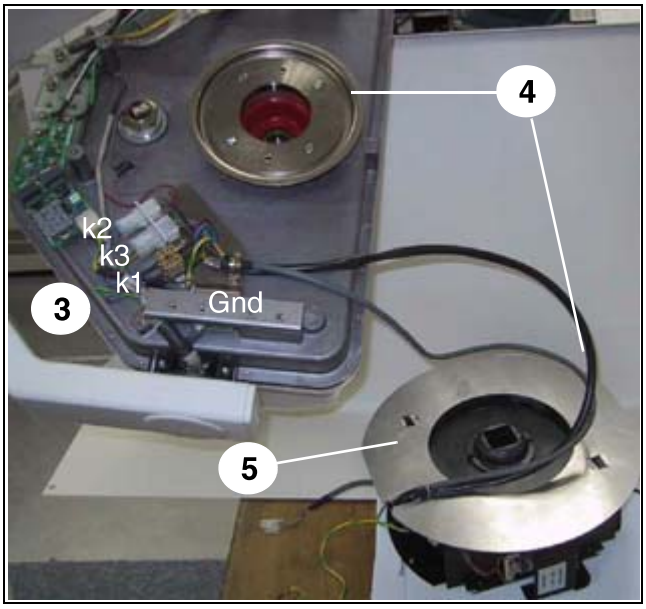

Fig. 91: Collimator cables

NOTE

Before removal, mark the exact position of the collimator.

When disassembling, pay attention to the cable layout for later assembly.

- Loosen the four Allen screws of the collimator and remove the collimator. (1/Fig. 90 / p. 92).
- Separate the four connectors k1/k2/k3 and Gnd (3/Fig. 91 / p. 93).
- If necessary, reinstall the deflector plate from the old collimator when replacing the collimator (5/Fig. 91 / p. 93).
- Connect the four connectors (k1/k2/k3 and Gnd) of the new collimator (3/Fig. 91 / p. 93).
- Position the collimator on the flange of the single tank while paying attention to the cable layout (4/Fig. 91 / p. 93).
- Center the collimator so that the flange screws engage underneath the flange edge.
- Alternately tighten the Allen screws of the collimator uniformly.
- Rotate the collimator from 0° to 180° and check the cable layout.
- Perform a light field - radiation field check (described below).
  - ➪ Place the single tank in the exposure position while taking into consideration the missing weight of the collimator cover.
  - ➪ Correct deviations > 1.7% via the four mounting screws of the collimator.
- Attach the collimator cover and connect the connectors (Fig. 87 / p. 90).
- Reconnect the plug of the DAP chamber (if present).
- Check the equilibrium of the support arm.

Light field - radiation field

- Place the cassette (35x35) or the detector for XP Digital on the tabletop.
- Set the central beam so that it is vertical.
- Set a vertical SID of 100 cm. Use the collimator measuring tape to measure to the cassette or top detector edge.
- Switch on the light localizer and set a light field of approx. 25x25.

NOTE

Darken the room if necessary, to allow you to see the edges of the light field more clearly.

- In the case of the XP Digital, place the lead measuring tap (centering cross) in the center of the detector.
- Measure the light field and make a note of the dimensions for the XP Digital.
- For XP/ Hybrid/ Eco, mark the light field with 4 washers (Fig. 92 / p. 94).
- Place one washer as a side marker (Fig. 92 / p. 94).

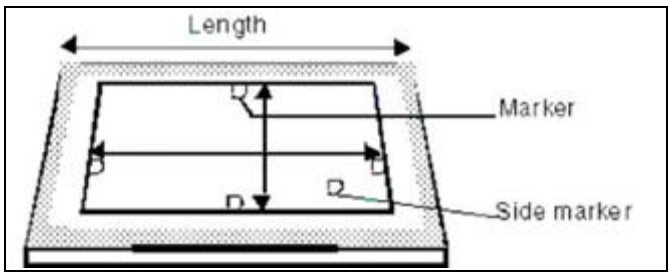

Fig. 92: Light field/radiation field, cassette

- For XP/ Hybrid/ Eco, select 55KV, 2.5mAs.
- In the case of the MOBILETT XP Digital
  - Create a test patient.
  - Select an organ program from the "TEST" area with approx. 60kV, 4mAs.
- Release an exposure.

Evaluation: light field to radiation field

- On all four sides, evaluate the deviations (A, C and B, D) between the edges of the light field and the edges of the radiation field on the film or monitor according to (Fig. 93 / p. 95). For MOBILETT XP Digital, use the zoom function if necessary.
- Calculate the overall deviation in the A, C and B, D directions (disregarding the sign).
  - ➪ The deviation must not exceed 1.7%. If the deviation is > 1.7%, the collimator must be adjusted via the 4 collimator mounting screws.

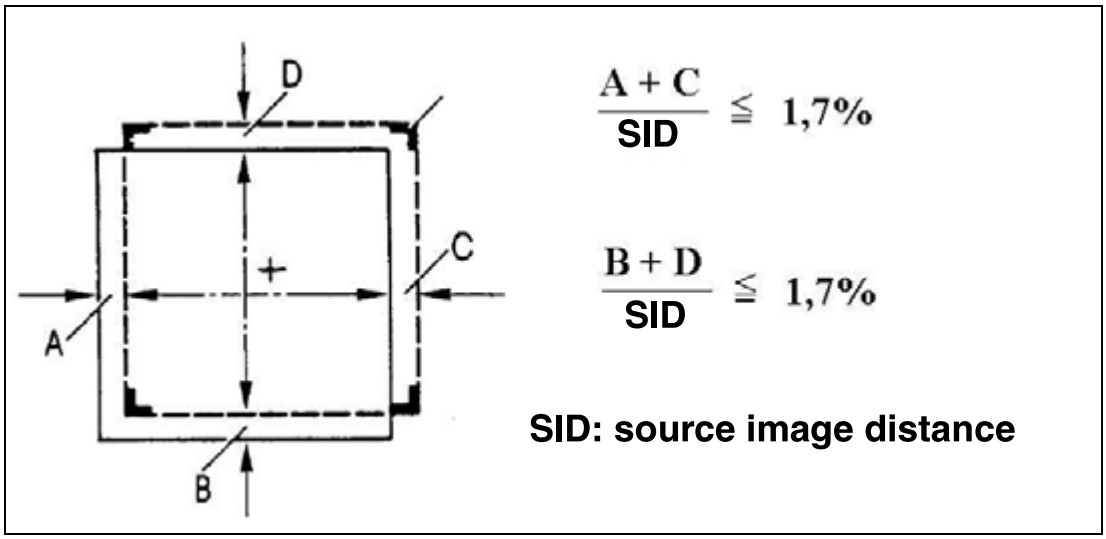

Fig. 93: Light field/radiation film

Detector

Replacing the detector

The detector is delivered with cables. Perform the following work steps to replace the detector:

1. Connect the detector cable to the "powerbox."
2. Change the detector serial number in the imaging system software.
3. Change the exposure counter. (The counter should always be reset to "0" when the detector is replaced.)
4. Calibrate the detector.
5. Check the image quality.

   For more information, see the documentation “Quality Assurance, SPR8-230.820.30...”
6. Create backup of configuration.

   For more information, see the documentation "Troubleshooting Guide, Imaging System, Backup/Restore."

Connect the detector cable to the "powerbox."

- The MOBILETT XP Digital is switched off.
- Open the rear cover panel of the MOBILETT XP Digital.
- Disconnect the detector cable at the "powerbox" and connect the new detector cable.

  ➪ For additional information, see the "Powerbox" section in this document.

Detector IP address

The factory setting is shown in the lower table. No changes are necessary.

LAN adapter/ Giga Link	Preset value
Host IP address	192.168.100.10
Subnet mask	255.255.255.0
Port for command	12121
Port for data	12122

Detector	Preset value
IP address	192.168.100.11
Subnet mask	255.255.255.0

Changing the detector serial number in the imaging system

Introduction

When the imaging system is initialized, the detector serial number is checked. If a different detector serial number is detected, an error message is displayed that the exposure function is blocked.

Preparation

- The MOBILETT XP Digital is switched off.
- Open the top cover of the MOBILETT XP Digital and place it on its side on a table or similar surface. Do not disconnect any cables.
- Remove the laptop securing bracket and open the laptop to gain access to the keyboard.
- Switch on the MOBILETT XP Digital.

Procedure

- Select SYSTEM/ CONFIGURATION/ ADMINISTRATOR SETUP/ SERVICE TOOL.
- Enter the administrator password.
  ➪ See password list.
- Select "unlock key" from menu.
- Click START and enter the Siemens service password.
  ➪ See password list.
- Click EXIT.
- Click OK.
- Click "RESTART FD".
  ➪ The application is restarted.
- Click the WINDOWS key or ESC and CTRL simultaneously.
  ➪ The Windows taskbar is displayed.
- Right-click on "Shortcut to ccrstart.bat" and select "Maximize."
  ➪ The following DOS menu is displayed (Fig. 94 / p. 98).
- Enter the following numbers:
  - “1” - Set-Up [1]
  - 0 - Normal [0]
  - 7 - Scan Sensor Setup [7]
- Confirm with the ENTER key “Max Capture Device = 1”.

- The captured and saved detector serial number is displayed.

  Enter the detector serial number at the cursor, e.g.: 10000006 and confirm with the ENTER key.

  (A/D Board Serial Number = A/D Board Serial Number of Sensor ID #1' ; e.g., 10000006)

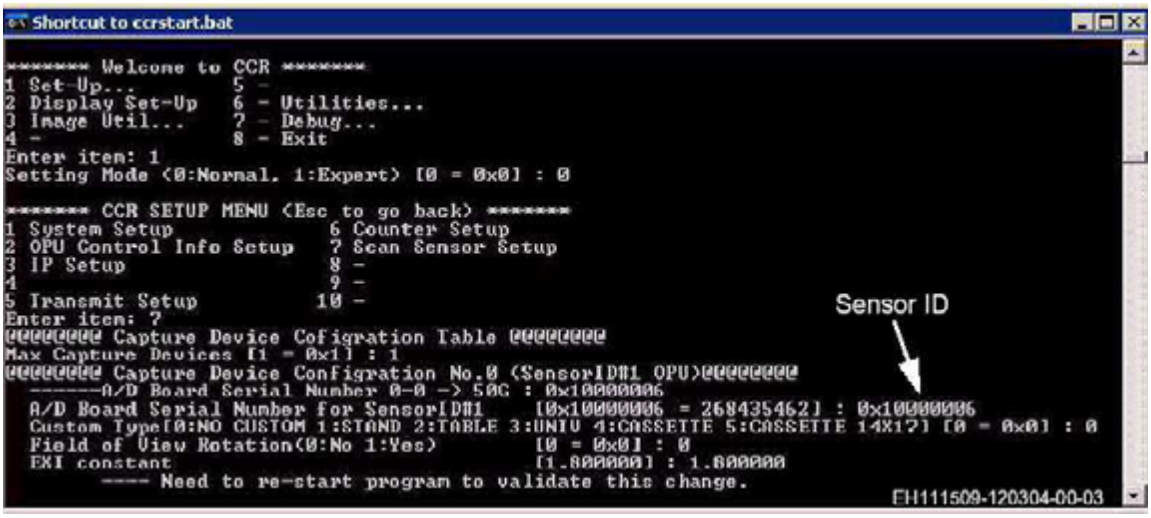

Fig. 94: Serial number

- Click “ESC”, click “ESC”, click “ESC” to save the data change.
- Enter "8" to close the setup menu.
- Switch the MOBILETT XP Digital "OFF" and back "ON".
  - ➪ After the detector serial number is changed, the detector must be calibrated.
- Calibrate detector.
  - ➪ For more information, see "Calibration of CXDI Detector" in "Troubleshooting of Imaging System" SPR8-230.30...
- Check the image quality.
  - ➪ For more information, see “Quality Assurance of MOBILETT XP Digital” SPR8-230.820.30...
- Create backup of configuration.
  - ➪ For more information, see “Troubleshooting Guide, Imaging System, Backup and Restore” SPR8-230.820.30...

Changing the exposure counter in the imaging system

When the detector is replaced, the image counter should be reset to "0".

Procedure

- Select SYSTEM/ CONFIGURATION/ ADMINISTRATOR SETUP/ SERVICE TOOL.
- Enter the administrator password.
  - ➪ See password list.
- Select in menu “Exit to OS”.

- Click START and enter the Siemens service password.
  - ➪ See password list.
  - ➪ The application is closed.
- Open Windows Explorer.
- Open the file: D:\CCR\ExpResult.ini.

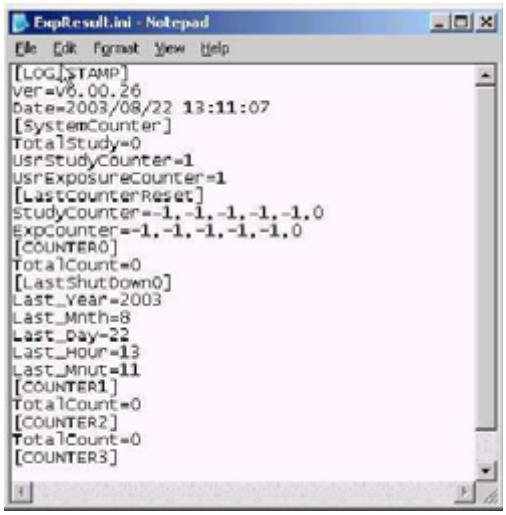

Fig. 95: Serial number

- Change the “TotalCount” value to "0".

Tab. 1 Total Image Counter

File ExpResult.ini	Screen display:	Note
[SystemCounter]		
TotalStudy=	TOTAL STUDIES	
UsrStudyCounter=	STUDY COUNTER	Can be overwritten on the user screen
UsrExposure Counter=	IMAGE COUNTER	Can be overwritten on the user screen
[LastCounterReset]		
StudyCounter=	Year, month, day, hour, minute	
ExpCounter=	Year, month, day, hour, minute	
[COUNTER 0]		
TotalCount=	Total number of images taken with sensor unit 1.	
[COUNTER 1]		
TotalCount=	Total number of images taken with sensor unit 2.	

File ExpResult.ini	Screen display:	Note
[COUNTER 2]		
TotalCount=	Total number of images taken with sensor unit 3.	
[COUNTER 3]		
TotalCount=	Total number of images taken with sensor unit 4.	

- Save and close the modified file D:\CCR\ExpResult.ini.
- Switch the MOBILETT XP Digital "OFF" and back "ON".
- Select “System/ System Information" and check the modified exposure counter.

Fig. 96: System information

➪ "TOTAL IMAGES" indicates the total number of images.

Replacing the detector cable

- The MOBILETT XP Digital is switched off.
- Open the detector as described in the section "Removing detector cover panel."
- Disconnect and remove the detector cable from the detector.
  - Remove the screws (M3x10 x2) for cable clamp 1.
  - Remove the screws (M3x6 x2) for the housing.
  - Remove the screws (M3x6 x2) for cable clamp 2.
  - Remove detector cable.
- Install the detector cable on the detector according to the above steps, in reverse order.

NOTE

During installation, pay attention to the cable routing.

Align cable housings.

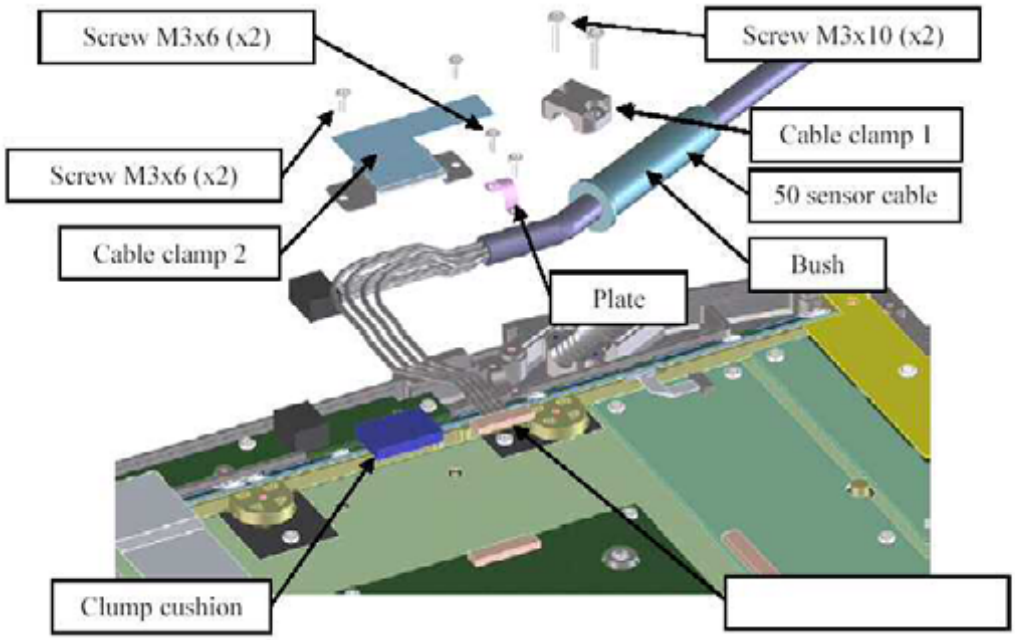

Fig. 97: Detector cabling

- Open rear cover panel of MOBILETT XP Digital.
- Disconnect defective detector cable at the "powerbox."
- Connect the new detector cable to the "powerbox."

  ➪ For additional information, see the "Powerbox" section in this document.
- Attach the cover panels.
- Switch on the MOBILETT XP Digital and perform a function check.

Detector cover panels

Removing the detector side cover panels

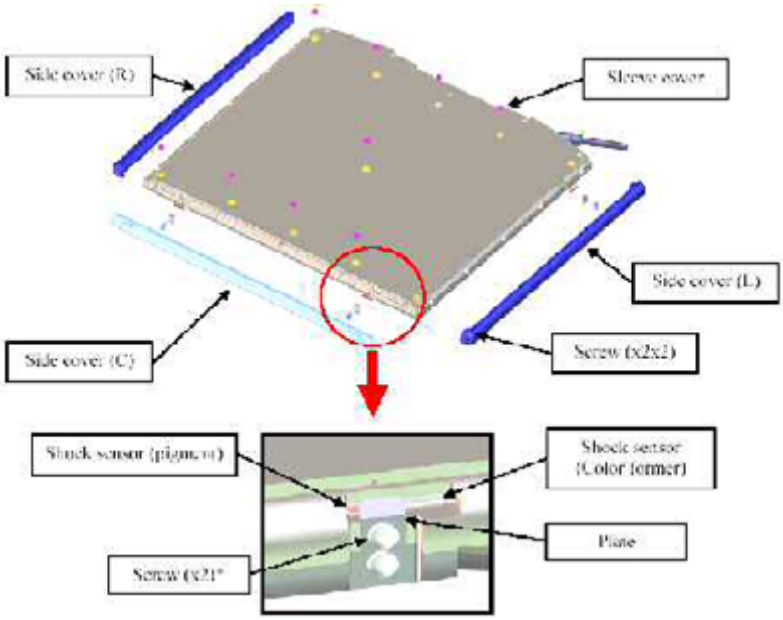

Fig. 98: Detector side cover panel

- Remove the screws (x2x2) of the side cover panels (L) and (R). Carefully disengage the cover panel from the bracket and remove it.

Removing the detector cover panel

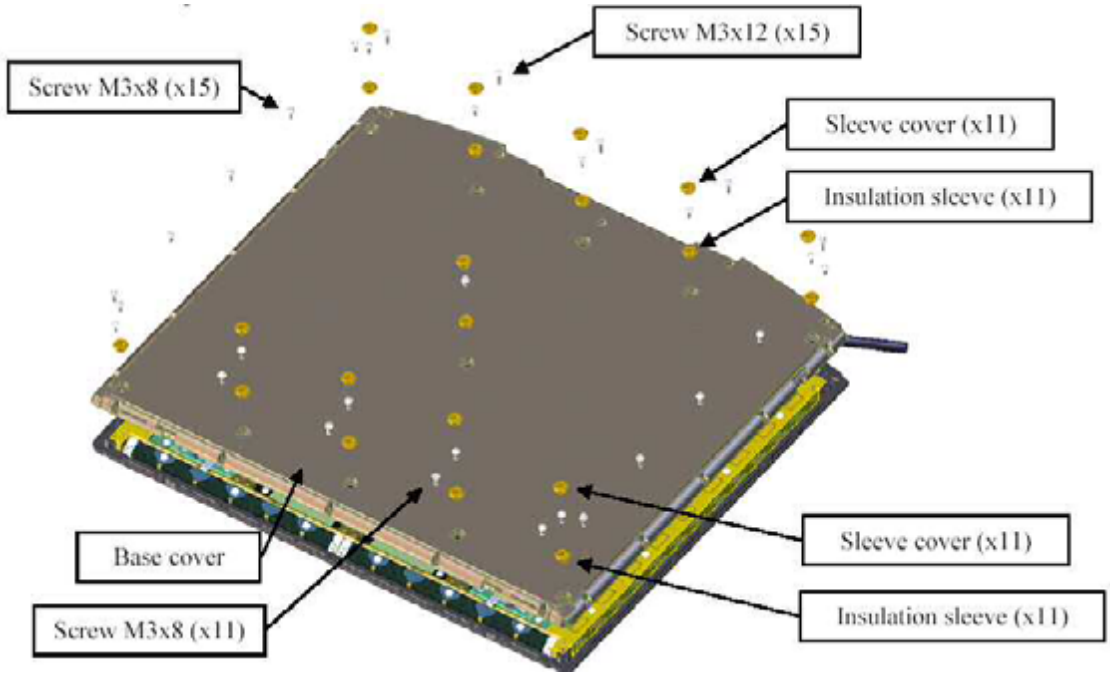

Fig. 99: Detector cover panel

- Remove insulating covers (x11) from detector.

- Remove all cover panel screws (x11).
- Remove cover and insulation sleeves.
- For assembly follow the directions above in reverse order.

"Powerbox" and power supply U3/U4

Mandatory work steps after replacement of "powerbox," U3, or U4:

1. Function check: exposure operation

Replacing the "powerbox"

- The MOBILETT XP Digital is switched off.
- Remove rear cover panel.
- Disconnect and remove cables
  - Sensor cable (detector cable)

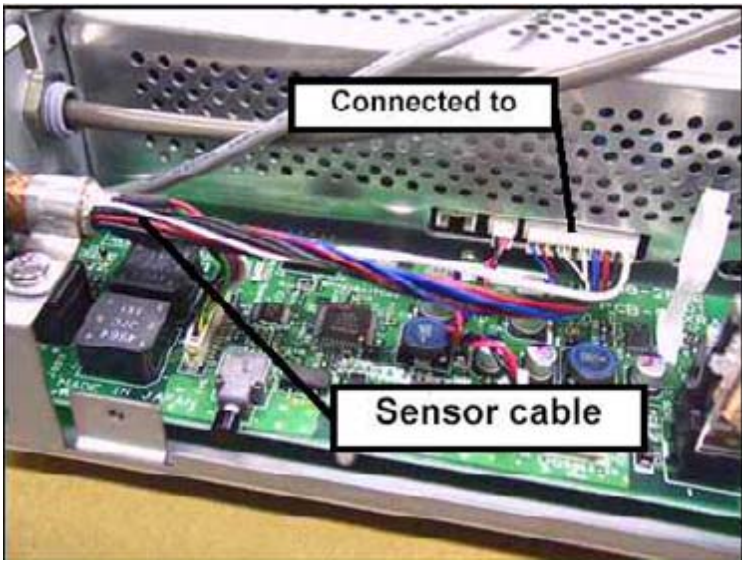

Fig. 100: Sensor cable

- Remote cable

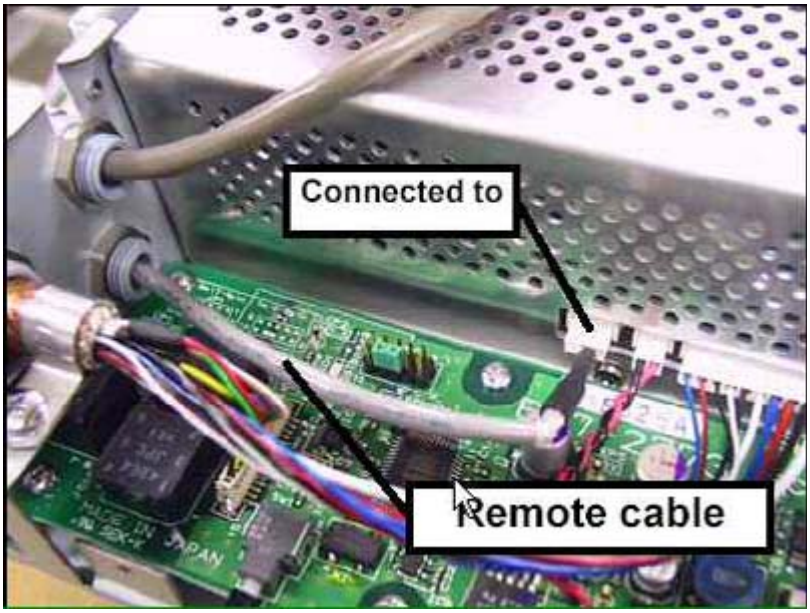

Fig. 101: Remote_Cable

- Generator interface cable

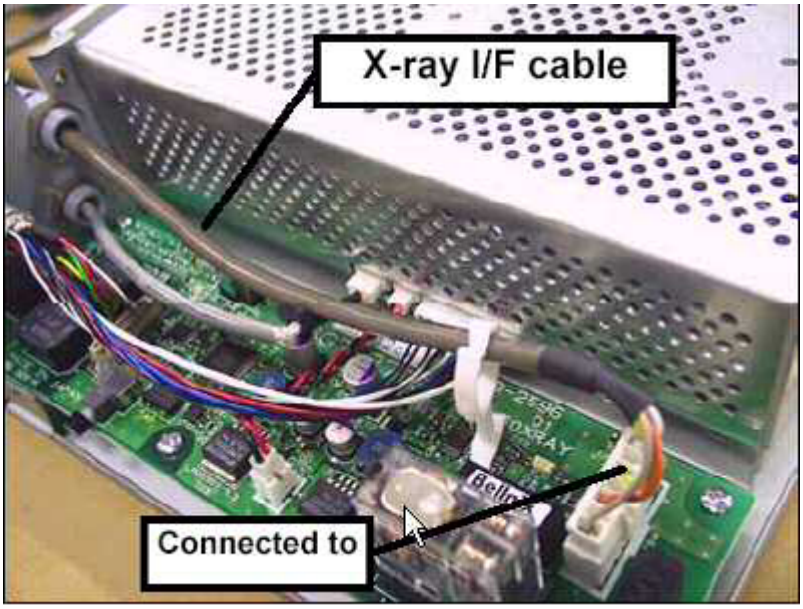

Fig. 102: X-ray cable

- Lift out the "power box" toward the front and remove the 5 screws on the back wall and the 2 screws on the underside.
- Install the new "powerbox" in the reverse order of the instructions above.
- Perform a function check of the MOBILETT XP Digital.

Replacing the U3 power supply (DC/DC transformer)

- The MOBILETT XP Digital is switched off.

- Remove the rear cover panel of the MOBILETT XP Digital.
- Disconnect cables from U3 power supply.
- Remove U3 power supply.
- Install the new U3 power supply in the reverse order of the instructions above.
- Perform a function check of the MOBILETT XP Digital.

Replacing the U4 power supply (DC/AC transformer)

- The MOBILETT XP Digital is switched off.
- Remove the rear and right-hand cover panels of the MOBILETT XP Digital.
- Disconnect cables from U4 power supply.
- Remove the two screws at the rear and the one on the right front side of the U4 power supply and replace the U4.
- For assembly follow the directions above in reverse order.
- Perform a function check of the MOBILETT XP Digital.

CXDI PC

Replacement of CXDI PC

NOTE

Delete all patient data before replacing the CXDI PC. Observe data protection guidelines.

If necessary, delete the folder D:\CCR\dtstore.

The CXDI PC is delivered with pre-installed software.

Prepare or create a backup of the current configuration.

- Read out and make note of the network data (IP address, subnet mask, gateway IP address, DNS servers) of the MOBILETT XP Digital.
  - ➪ For more information, see the document “Software Installation, SPR8-230.816.30..."
- The MOBILETT XP Digital is switched off.
- Open the top cover of the MOBILETT XP Digital and place it on its side on a table or similar surface.
- Remove the CXDI PC retaining bracket.
- Disconnect cables from CXDI PC.
- Place the new CXDI PC in the docking station in such a way as to ensure access to the keyboard.
  - ➪ When replacing the CXDI PC, make sure that any additional external expansion cards installed in the old CXDI-PC are taken out and installed in the new one.
- Connect the cables to the CXDI PC.
- Switch on the MOBILETT XP Digital.
- Configure the IP address of the MOBILETT XP Digital.
  - ➪ For more information, see the documentation "Software SPR8-230.816.30..., Software Configuration".
- Restore the system configuration with the configuration backup for organ programs and customer configuration.
  - ➪ For more information, see the documentation "Troubleshooting Guide, Imaging System SPR8-230.840.30..., Backup and Restore."
- Install the CXDI PC complete with the securing bracket and attach the upper cover panel.
- Perform a functional check.

Replacing the network adapter

NOTE

The Belkin network adapter (Realtek) is no longer available.

To install a new network adapter, observe the following instructions.

Preparation:

- The MOBILETT XP Digital is switched off.
- Open the top cover of the MOBILETT XP Digital and place it on its side on a table or similar surface.
- Remove the holding bracket of the CXDI PC and open the CXDI PC to gain access to the keyboard. All cables and plug connections remain in place.

Uninstalling the (Realtek) network adapter

- Switching on the MOBILETT XP Digital
- Select SYSTEM/ CONFIGURATION/ ADMINISTRATOR SETUP/ SERVICE TOOL.
- Enter the administrator password.
  - ➪ See password list.
- Select "unlock key" from menu.
- Click START and enter the Siemens service password.
  - ➪ See password list.
- Click EXIT.
- Click OK.
- Click "RESTART FD".
  - ➪ The application is restarted.
- Click the WINDOWS key or ESC and CTRL simultaneously.
  - ➪ The Windows taskbar is displayed.
- Open “Start/Settings/Network connections” under “Windows,” as described in the document “Software Installation, Network configuration, SPR8-230.816.30...”.
- Select “Properties” under “LAN2”.
- Select “TCP/ IP”.

- Read out network configuration data and note down for future use. Close the screen with OK.
  - ➪ IP address:
  - ➪ Subnet mask:
  - ➪ Gateway, if applicable:
  - ➪ DHCP, DNS, if applicable:

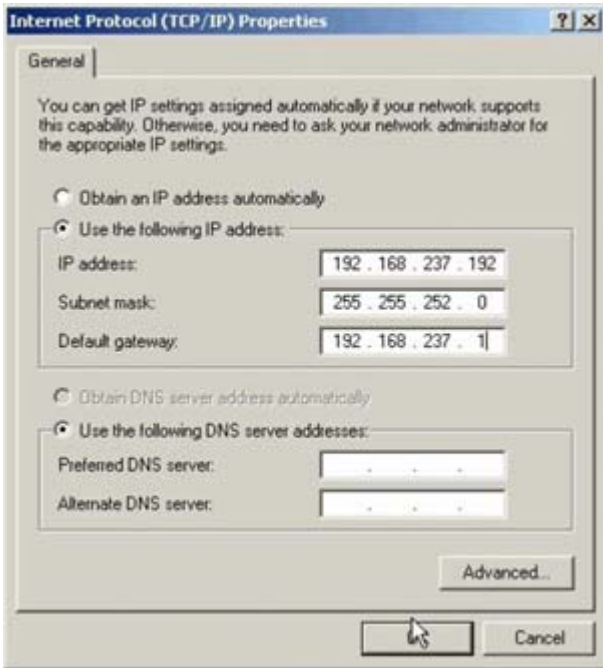

Fig. 103: TCPIP_properties

- Select “Properties” of the “LAN2” Adapter und open “Configure...”.

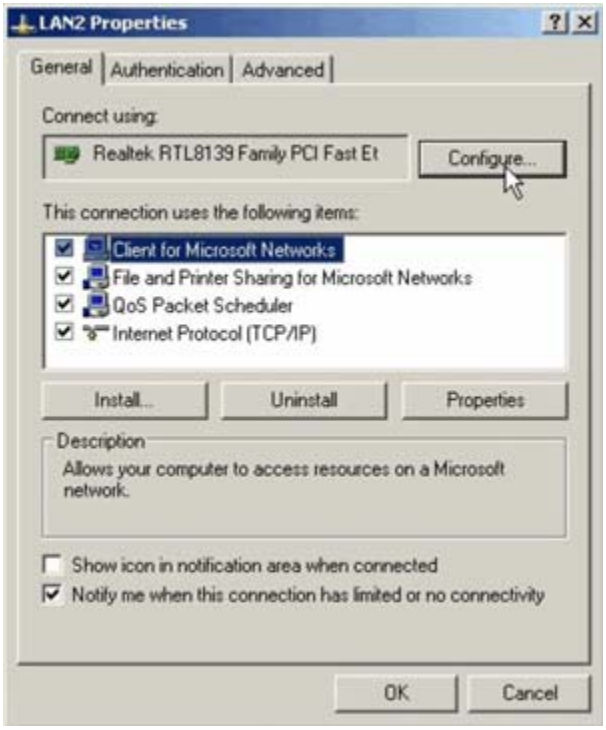

Fig. 104: Configure_LAN2

- Select “Advanced”, read out values for network adapter's “Link Speed” and note down for later use (factory setting = Auto Mode). Close the screen with OK.

  ➪ Link Speed:

Fig. 105: AdapterLAN2_Speed

- Select “Driver” tab.
- Select “Uninstall” and follow the instructions in the menu.

  ➪ The driver for the Belkin (Realtek) network adapter is uninstalled.

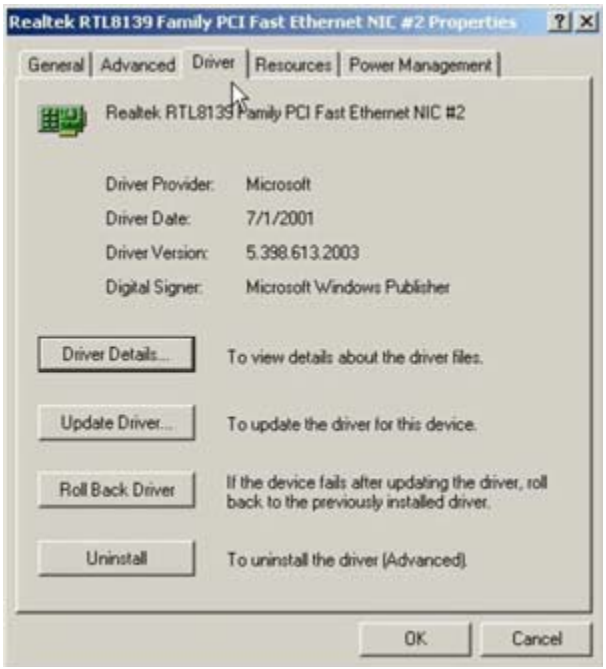

Fig. 106: Driver_LAN2

- Switch the MOBILETT XP Digital OFF.

Replacing the network adapter

- Disconnect cable from Belkin (Realtek) network adapter. Remove adapter from CXDI PC and insert the new adapter (e.g., Netgear).

NOTE	**A longer network adapter cable, material number 10022676, is required.**

Fig. 107: NetgearCard

Installing the Netgear network adapter

- Start the MOBILETT XP Digital.
- Open “Start/Settings/Network connections” as described above in the section “Uninstalling the network adapter."
- Select "properties" of the automatically created LAN adapter, e.g.: “Local Area Connection 3”.

Fig. 108: Network_connection_LAN3

- Select “Configure...” in the LAN adapter menu.

- Select “Driver” tab.

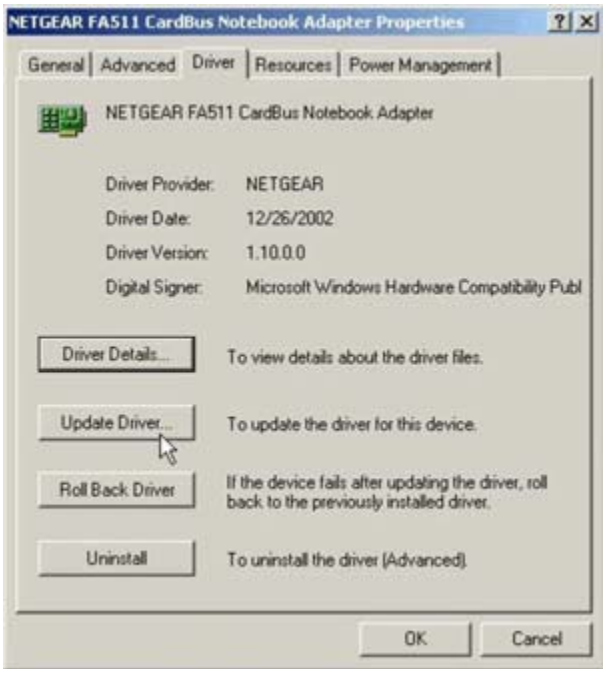

Fig. 109: Update_Netgear

- Place the system DVD (“VA04” or higher) in the DVD drive.
- Select “Update Driver”.
  - ➪ The “Hardware Update Wizard” starts.
- Confirm in in the menu with “Yes, this time only” and click “Next”.
- Select “Install from a list or specific location (Advanced)” and click “Next”.
- Check the checkboxes as shown in the following illustration. Enter path “E:\Setup CD\Drivers\Netgear FA511” and click “Next”.

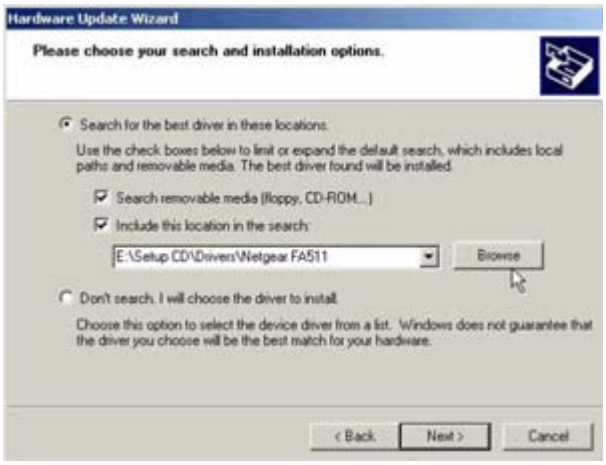

Fig. 110: Update_Net_3

- Click “Finish”.
- Select “Advanced” tab.
- Configure “Link Speed (Media Type)” as noted down previously (factory setting = AutoSense/ Auto Mode).
- Confirm with "OK".

- Select “TCP/ IP” in the newly created network adapter.
- Enter network adapter data previously noted down:
  - ➪ IP address:
  - ➪ Subnet mask:
  - ➪ Gateway, if applicable:
  - ➪ DHCP, DNS, if applicable:
- Click "Close" to save the network adapter settings.
- Message box appears, warning that another network adapter with the same IP address exists; confirm with "No."
- Change the name of the newly created network adapter, e.g., “Local Area Connection 3,” to LAN2 in the "Network Connections" menu.
- Switch the MOBILETT XP Digital OFF.
- Install the CXDI PC complete with the securing bracket and attach the upper cover panel.
- Perform a functional check.

Touch screen display

The touch screen display must be installed with a touch screen free of dust and grease.

After installing the touch screen display, perform the following work steps:

1. Calibrate the touch screen.
2. Adjust brightness and contrast using the SMPTE image.

Mechanical replacement of the touch screen display

- The MOBILETT XP Digital is switched off.
- Open the top cover of the MOBILETT XP Digital and place it on its side on a table or similar surface.
- Disconnect the touch screen display cable.
- Remove the six locknuts and washers.
- To facilitate removal of the touch screen display, remove the side mounting screws in the upper cover panel if necessary.
- Remove the touch screen display from the housing.
- Remove the old gasket from the inner edge of the upper cover panel.
- Insert the new gasket (included with delivery) into the inner edge of the upper cover panel.
- Insert touch screen display and secure it with the 6 nuts and washers.
- Reconnect the cables to the touch screen display.

Perform touch calibration

- Switch the MOBILETT XP Digital on.
- Select SYSTEM/ CONFIGURATION/ ADMINISTRATOR SETUP/ SERVICE TOOL.
- Enter the administrator password.
  ➪ See password list.
- Select "unlock key" from menu.
- Click START and enter the Siemens service password.
  ➪ See password list.
- Click EXIT.
- Click OK.
- Click "RESTART FD".
  ➪ The application is restarted.
- Click the WINDOWS key or ESC and CTRL simultaneously.
  ➪ The Windows taskbar is displayed.
- Open “Start/Settings/Control Panel”.

- From the control panel, open “ELO, Elo Touchscreen” and select "Align" from the "General" menu.
- Follow the instructions on the touch screen display.
  - ➪ Confirm touch points
- After completing the touch calibration, close menu with OK, then switch the MOBILETT XP Digital OFF and back ON again.
- Perform a functional check.

Brightness and contrast settings

- Adjusting touch screen display - brightness and contrast settings (see back of touch screen display). The 5% and 95% fields must be visible.
  - ➪ Adjust contrast toward + until the 95% field disappears, then back a bit.
  - ➪ Alternatively, the values can be measured with the Mavo monitor:
    Black field: approx. 0.6 - 0.9 cd/qcm
    White field: approx. 150 cd/qcm +/- 20
  - ➪ For more information, see the document “Quality Assurance, SPR8-230.820.30...”

Final activities

- Install upper cover panel of MOBILETT XP Digital.
- Perform a function test.

Chapter	Section	Revision
All chapters	n.a.	Editorial changes.
Replacement of electrical components	D916 settings	New illustration added.
Replacement of electrical components	Capacitor bank	Completely rewritten
Replacement of electrical components	Boards, battery operation, and motor control	New instructions added
Replacement of mechanical components	Replacement of the single tank	New illustration added.
Replacement of mechanical components	Power cord or cable winch	Completely rewritten
Multileaf Collimator	Light field/radiation field	Completely rewritten
Imaging System (XP Digital)	n.a.	Completely rewritten; new sections on replacing touch screen display and network adapter